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MINE BOOKKEEPING

A COMPREHENSIVE SYSTEM OF RECORDS AND ACCOUNTS FOR MINING OPERATIONS OF MODERATE DIMENSIONS

BY

ROBERT McGARRAUGH, E.M.

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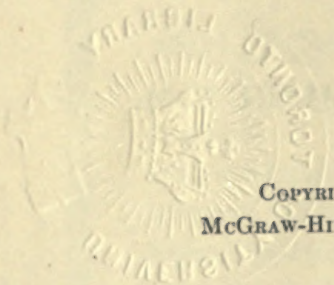

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PREFACE

This book has been prepared in the belief that a real need exists among engineers and operators for a comprehensive outline of bookkeeping and accounting methods, applicable to the requirements of mining operations of modest size. At the beginning, it can be stated with conviction that neither the perfect system of accounting nor the perfect set of accounts has yet been produced, at least as applied to the mining industry. A timely word of caution is extended to the reader against the too literal acceptance *per se* of the forms and records as given. Each individual case presents its own set of conditions, to which the records must be adapted, and the various forms should be regarded as suggestive rather than constituting a definite outline to be followed under all circumstances. In the following pages, a knowledge of the principles of simple bookkeeping has been assumed.

Acknowledgment has been made wherever the writer is aware that material has been gleaned from books and magazine articles on the subject, but as the methods outlined have been gradually developed in practice, no doubt the written ideas of others have been taken in some instances, while the sources of information are now forgotten. Special acknowledgment is made to Mr. W. H. Charlton, whose excellent work, "American Mine Accounting," has been a valuable reference in the preparation of this small volume.

ROBERT MCGARRAUGH.

COPPERHILL, TENNESSEE,
January, 1920.

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MINE BOOKKEEPING

CHAPTER ONE

INTRODUCTION

Objects in View.

A comprehensive system of records and accounts is the only safe foundation upon which to build any successful business. Accounting and cost-keeping as applied to the mining industry constitute a special field which cannot be adequately covered by any stereotyped outline of records and accounts; the phases of mining work are infinite and the conditions met with will require adjustments of the methods employed in almost every case. To the mine operator, the careful study of working costs is essential in establishing and maintaining an efficient organization. Suggested improvements and changes are of frequent occurrence, and these can only be considered in relation to the reduction in operating expenses, or to the increase in output, which will be effected. Once established, a cost system serves as a gauge to determine the relative value of the results which are being obtained. After the work in any department is running smoothly, with waste in effort and materials eliminated, it should be a comparatively easy matter to maintain, or perhaps to exceed, the standard of economy which has been set. By keeping cost data always in evidence, a healthy state of rivalry may be established in every branch of the work; each department head is given an incentive to keep down expenses and to increase the efficiency of his part of the organization. Present results can be compared with those obtained during previous periods; waning effort or wasteful methods will soon be detected. Such a condition of rivalry is invaluable in keeping up general interest and in getting each subordinate to contribute his best efforts to the common end.

Information should be at hand, in an easily accessible form, showing in detail the costs of performing any operation involved in the work, as well as a comparison between the present cost and that of former periods. The itemized cost-in-place of any important piece of machinery, or of any other item of installation or construction, should be available without waste of time in searching through the records for it. In most cases, such information, as a source of comparison with the results obtained at other mines, will prove to be of little value. The principal object of any system of cost-keeping should be to furnish reliable information and comparisons as applied to the work at hand. The variations in working conditions which prevail in different districts, and even among the mines of the same locality, are sufficiently marked to make comparisons with other places misleading. Furthermore, the details of cost-keeping, and the classifications in use, will differ to an extent that comparisons of cost data from different places cannot be regarded with confidence.

The segregation and distribution of cost data is essentially an engineering undertaking, and, as such, should be under the supervision of some one who is familiar with all phases of the work and who clearly understands the results which are desired. If left entirely to clerks, who as a rule have comparatively little knowledge of the working conditions, the methods employed will inevitably degenerate into a cut-and-dried routine and much of the value of the accounts will be lost. The working out of the details of accounting should be delegated as much as possible to the clerical staff, where it belongs, but persistent supervision is necessary in order that the results shall represent the existing conditions to a reasonable degree of accuracy. In outlining a system of accounts, the first consideration should be concerning the amount of detail which can be *accurately* handled. A comparatively simple set of accounts, with the classification of expenditures accurately made, is of incomparatively greater value for the analysis of costs than an elaborate subdivision, the details of which have been largely approximated or guessed at. In order that the handling of accounts does not become an onerous burden to

those who already have an abundance of other duties, they should be made as concise and as easily understood as possible. The name used to designate each account should be definite and also descriptive; this tends to avoid confusion, as many details will have to be left to shift bosses and others who are not familiar with the accounts, and who are usually not especially interested in them.

To make an intelligent analysis of the work at hand, the cost of performing each operation must be determined in terms of the unit involved; this unit may be ton of ore milled, ton of ore stoped, foot of drift or crosscut, etc. It is obvious that to be of economic value, a saving in the cost per ton of ore produced must not be accompanied by a corresponding drop in the grade of that ore; on the other hand, an increase in the cost of production may be more than offset by the gain in recovery which has been effected. The grade of ore which can be mined and treated at a profit should be definitely known. It is sometimes the case that this factor has not received sufficient consideration, or that it has not been kept before those who are responsible for the actual mining operations. Where appreciable variations in mining conditions occur in different parts of the mine, the grade of ore which can be taken out at a profit from each working place should be determined. Ore which assays above this grade can be profitably mined and treated; anything of lower grade can only be handled at a loss and should be left. In case that a shortage of ore which can be mined and treated at an actual profit occurs, the grade at which ore can be handled in preference to running below capacity must be determined. Muck from development faces must be disposed of, and it is then the question whether rock which is already broken and in the car should go to the treatment plant or over the dump.

While cost statements furnish valuable information concerning the economy of the operations, they should not be depended upon entirely for the direction of the work, as by the time that monthly statements have been completed the information contained in them is of the nature of past history. The live manager or superintendent will require sufficient

daily records to keep his hand upon the pulse of the organization at all times, and any irregularity which may develop will be recognized as soon as it makes an appearance. To this end, daily reports should be required from each department, giving the essential information concerning the work and the results accomplished. The use of such reports fixes responsibility between the superintendent and the heads of departments, and serves in a great measure to prevent procrastination and slacking of interest.

Records of supplies on hand and on order must be kept; these are of particular importance when the mine is located beyond easy access to the sources of supply. Statements showing the average consumption of each essential item of material used will facilitate the maintenance of an adequate stock without loading up too heavily with any one article. When the mine is located at some far-distant place, where the delivery of supplies is a matter of many weeks or even months after the order has been sent forward, the maintenance of a well balanced stock of supplies is one of the most difficult, and certainly one of the most important, problems which must be met.

The object of this volume is to show an adequate system of records and accounts for smaller mines, as distinguished from the elaborate systems, requiring a large clerical staff, which may be necessary when the operations are conducted on a very large scale. The system as outlined can be maintained at a minimum of office expense, as the object in view at all times is to eliminate unnecessary posting and copying, and to get the accounts into their final form with the fewest possible intermediate operations. As in any branch of engineering, the best results can only be obtained by establishing order and well-defined methods for handling the variety of detail which is a necessary adjunct to any form of accounting. Filing and indexing appliances are in almost universal use at the present time. Here, as elsewhere, simplicity is desirable, and standardized methods of filing should be used in all departments to avoid confusion and loss of time.

Classification of Accounts.

In general, mine expenditures fall into three classes; these

are known as "Capital Charges," "Suspense Charges" and "Operating Expenses." "Capital Charges" comprise those expenditures which represent the original investment and additions and improvements of a permanent nature. "Suspense" or "Deferred Charges" are made for outlays, the benefits from which will be derived at some future time, usually extending over a considerable period; payments of taxes, insurance premiums, etc., which cannot properly be charged out at once to the expenses of mining and treating the ore, are carried as suspense accounts and are charged out into the operating expenses through the period during which the benefits from the expenditure are realized. "Operating Expenses" include all charges which are incident to the process of mining and treating the ore and of marketing the product, with the exception of those items which have been charged into the capital and suspense accounts.

Capital and Suspense Accounts.

As a general rule, the tendency of the mine operator is to charge too many expenditures into the capital accounts, in a misguided effort to show low working costs. New constructions, permanent improvements and additions in equipment should be included under capital charges, as well as important renewals to the installation, the cost of discarded equipment being written off as depreciation. Such items as shafts, headings, etc., which are necessary to maintain the production of ore, add nothing to the actual value of the property but rather serve to indicate a diminishing ore reserve. It may be desirable, however, to carry such expenditures as suspense accounts, to be charged off upon an equitable basis to the operating expenses, in order that the value of the working costs for comparisons will not be affected. By many companies, underground work such as main shafts, stations, exploration crosscuts, etc., are included in the capital charges, being considered as coming under the designation of improvements, and this should be done when the work adds a tangible value to the property. The more common practice, however, is to charge out as many of these expenditures as possible to

the operating expenses, when there is no definite distinction at which a line can be drawn between work done to maintain the output of ore and that which can be considered as an improvement to the property.

Amortization.

Mining ventures differ from most forms of enterprise in that the supply of raw material, the ore, is a fixed quantity which cannot be replenished. To be classed as a profitable business, it is essential that the operation of the mine not only show a reasonable return on the investment as interest, but the principal must be returned by the time that the ore-supply has become exhausted. The length of useful life of a mine, in the great majority of cases, is of comparatively short duration, and a basis of reimbursement from the gross income must be adopted, which will eventually return the original investment, after deducting the ultimate selling value of the property. This return of the principal by a reimbursement fund, independent of dividends, is known as "amortization." In order to determine the rate of amortization to be allowed, the probable length of useful life of the mine must be defined. If there is no knowledge of the ultimate ore-supply upon which to base a more definite conclusion, a period of years must arbitrarily be decided upon, during which the return payments of the capital invested are to be set aside from the gross earnings. The advance of mining operations will give additional knowledge concerning the extent of the ore-bodies, and revisions in the estimated length of life of the mine may be considered advisable and necessary from time to time to conform to the variations in conditions. Amortization charges will not appear in the mine accounts, but will be taken care of in the records at the head office of the company.

Depreciation.

The plant and improvements on the property are subject to a constant diminution in value; machinery wears out or becomes obsolete and improvements become useless as the

field of operations changes with the mining out of the ore-bodies. This expiration of values, due to the wearing out and obsolescence of equipment, and also to the termination of its usefulness by the exhaustion of the ore-supply, is known as "depreciation." With the exception of repairs and minor replacements, which can be charged out at once to the operating expenses, the cost of all new equipment should be charged into the capital accounts, to be written off to the costs of current operations over the estimated period of useful life of each installation. When equipment is scrapped, if the original cost, with deductions for salvage to be realized, has not been covered by the depreciation already allowed, the difference should be charged off at once to Profit and Loss. All charges for depreciation should appear in the mine accounts.[1]

Operating Expenses.

Operating expenses fall into two groups; these may be called "Direct Charges," and "Indirect" or "Redistributable Charges." "Direct Charges" include all expenditures which are made for some defined result in the operations, or for some purpose for which no equitable basis for redistribution is apparent. "Redistributable Charges" are those which must be "spread" over the other accounts, in proportion to the benefits conferred, in order that the ultimate results from them may be determined. In the segregation and division of the operating expenses, the greatest inherent difficulty is usually found in this "spreading" of the redistributable charges. These expenditures must be subdivided among the other accounts, each redistributable account being considered separately. It will be recognized that some classes of work show no definite results which can be referred to the accounts ultimately benefitted, and these could only be redistributed by an arbitrary division. For instance, mine maintenance accounts, supervision, etc. offer no basis for an accurate re-

[1] Engineering & Mining Journal of April 6, 1918; notes on depreciation and obsolescence as allowed by the U. S. Federal Tax Laws, from a pamphlet issued by Loomis, Suffern and Fernald, Public Accountants, New York.

distribution to the costs of the different workings in the mine and could only be arbitrarily divided among them. The "spreading" of the indirect charges is often the source of misleading results, and efforts in this direction should be confined to those accounts which present definite data for their subdivision. The personal element is certain to appear in distributions which are arbitrarily made and the resulting working costs are rendered unreliable for comparisons with other periods, when a different basis of subdivision may have been used. It must also be recognized that the "spreading" of these charges over the other accounts has a tendency to obscure the differences which the working costs are intended to expose, by burying accurate data under a mass of figures, which, at best, can only be regarded as an approximation. In the subdivision of accounts, the point is soon reached at which further refinements only make for confusion. It is to be recommended that efforts be directed towards simplicity and clearly defined results, rather than towards the accumulation of a large amount of intricate detail which cannot be accurately determined without an unwarranted outlay.

CHAPTER TWO

OUTLINE OF ACCOUNTS

In establishing a system of accounts, the details of the work must necessarily be adapted to the local conditions, and the accounts to be used can only be decided upon after a careful study of the case in point. In order that the reader may recognize more readily the uses and application of each record described in the following pages, a typical outline of accounts has been adopted; it should be a comparatively easy matter to alter these accounts to apply to the particular case. The accounts shown are simple and easily kept, but they may be elaborated upon to any reasonable extent without affecting the application of the methods outlined.

GENERAL MINE ACCOUNTS

Operating Expenses.

Direct Charges	Indirect Charges	
0 Dead Work.		
01 Breaking ground	A. Hoisting	
02 Tramming	B. Drills and compressors	P. Power
05 Timbering		
06 Pumping	C. Tool sharpening	
1 Development.		
11 Breaking ground	A. Hoisting	
12 Tramming	B. Drills and compressors	P. Power
15 Timbering		
16 Pumping	C. Tool sharpening	
2 Stoping.		
21 Breaking ground	A. Hoisting	
22 Tramming	B. Drills and compressors	P. Power
23 Shoveling		
24 Filling	C. Tool sharpening	
25 Timbering		

3 Mine General.

31 Foremen and bosses
32 Track & supplies
33 Drill steel
34 Maintenance tramming — P. Power
35 Maintenance timbering
36 Maintenance pumping & draining
37 Mine miscellaneous

4 Ore Treatment.

41 (Subaccounts should be carried to
42 cover each operation in the proc- — P. Power
43 ess of treatment)
44
etc.

5 Marketing Bullion.

6 General Expense.

61 General office
62 Engineering
63 Assaying & sampling
64 Hospital
65 Legal
66 Taxes
67 Insurance — P. Power
68 Boarding house
69 Policing
610 Stable
611 Building maintenance
612 Water supply
613 Lighting
614 Telephones
615 Roads
616 Tools account
617 Shop expense
618 Surface foremen & bosses
619 General miscellaneous

Current Capital Charges.

7 Live Stock & Vehicles.

8 Furniture & Fixtures.

9 CONSTRUCTIONS & IMPROVEMENTS.
91 (A subaccount is opened for
92 each construction or installation) P. POWER
93
94
etc.

Suspense Accounts.

TAXES
INSURANCE

Other General Ledger Accounts.

HEAD OFFICE
BULLION
CASH
ACCOUNTS PAYABLE
ACCOUNTS RECEIVABLE
GENERAL SUPPLIES
UNCLAIMED WAGES
PROFIT & LOSS

Diagrams.

The entries for any transaction will be clarified by the use of a diagram, which serves to visualize the operation. The diagram shows the debits and credits involved and furnishes a concise means of indicating the completed transaction. The following diagram shows the entries in simple for the purchase of a bill of supplies from the Mine & Smelter Supply Co.:

General Supplies		Mine & Smelter Supply Co.		Cash	
Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
(1) $726.00			$726.00		
(2)		$726.00			$726.00
$726.00		Closed			$726.00

The first entry charges General Supplies with the amount of the materials purchased and credits the account of the Mine & Smelter Supply Co. The second entry indicates the pay-

ment of the bill; this closes out the account of the Mine & Smelter Supply Co. and Cash is credited with the amount paid.

DEFINITIONS OF ACCOUNTS

Operating Expenses.

The entries to Operating Expenses and also to the Current Capital Accounts are invariably debits, with the exception of a very few minor credits, as medical dues credited to the Hospital account, payments received for assaying done for outsiders credited to Assaying & Sampling, etc. These minor credits are entered upon the books in red ink.

Direct Charges.

In the outline of accounts given, Dead Work, Development and Stoping are intended to cover direct charges only. The expenditures for Hoisting, Drills & Compressors, Tool Sharpening and Power are included under Indirect Charges and these are redistributed to the accounts benefitted at the end of the month.

0. Dead Work includes the costs of all mine openings, as shafts, stations, crosscuts, etc., which are not driven in the ore-body.

1. Development includes the costs of all openings, the purpose of which is to block out ore and to make the ground accessible for stoping.

2. Stoping charges include the costs of breaking ore, of delivering it to the loading chutes, and of supporting the resulting excavations while the work is in progress. Sub-accounts for filled stopes are shown.

3. Mine General: Under this heading, those mine accounts appear which do not offer an adequate basis for redistribution to the essential accounts benefitted, namely, Dead Work, Development and Stoping.

31. *Mine foremen & bosses:* This account is charged with the salaries and wages of all underground foremen and bosses; also with any supplies used by them, as for lighting, etc.

32. *Track & supplies:* The costs of all track material for mine use, as rails, bolts and nuts, splice bars, spikes and ties are charged to this account. The labor of laying track may be charged out here or directly to the account benefitted. When track is torn up for the recovery of materials, the work is charged to this account.

33. *Drill steel:* The cost of all machine and hand steel for underground use is charged to this account when the material is issued from the warehouse; also cost of shanking and preparing new steel for use.

34. *Maintenance tramming:* The upkeep of mine tracks and of tramming equipment is charged to this account.

35. *Maintenance timbering:* This account covers the charges for repairs and replacements of mine timbers. Charges to new timbering are made directly to the account benefitted whenever possible.

36. *Maintenance pumping & draining:* This account covers the costs of pumping and draining, other than the costs of keeping Dead Work and Development openings unwatered; it includes costs of cutting and maintaining ditches, etc. If ditches are cut when the headings are driven, the costs may be charged directly to the headings.

37. *Mine miscellaneous:* Items of mine expense which cannot logically be charged elsewhere are thrown into this account. The Miscellaneous account should be used as little as possible.

4. Ore Treatment charges include the costs pertaining to the extraction of the valuable content from the ore, after this ore has been mined and delivered at the reduction plant. Subaccounts should be in use showing each step in the process of treatment.

5. Marketing Bullion charges include the costs of delivery and sale of the resulting bullion.

6. General Expense is made up of the following subaccounts:–

61. *General office:* This account is charged with the salaries of the administrative and clerical staff, and includes the salaries of time-keepers, warehouse clerks, etc. It is also

charged with the costs of stationery and printing, postage and general office supplies.

62. *Engineering* includes the charges to the engineers' office: draughtsmen, surveyors, helpers and supplies.

63. *Assaying and sampling* includes the cost of labor, supplies and power charged to this work. The account is credited with any income received from outside sources for assaying.

64. *Hospital* expense includes the cost of salaries, supplies, etc. Employees are usually charged a medical fee and the amount collected in this manner is credited to the Hospital account.

65. *Legal:* Court expenses, retainer fees, etc. and all costs incurred through litigation are charged to this account.

66. *Taxes:* The yearly taxes are anticipated and are charged out in equal monthly installments. Any differences between the estimated and the actual amounts are adjusted at the end of the year. Payments for taxes are handled through a ledger suspense account.

67. *Insurance* premiums are handled in the same manner as payments for taxes.

68. *Boarding house:* The total cost of operating the company hotel is charged to this account. It is credited with the receipts for board furnished.

69. *Policing* expense includes the wages of policemen and watchmen; also the cost of any materials issued to them for illumination, etc.

610. *Stable* expense includes the costs of labor, feed, maintenance of pastures, operation and maintenance of motor vehicles, etc.

611. *Building maintenance* is charged with the upkeep of the company offices, dwellings, etc. It is credited with the receipts from house rents.

612. *Water supply* includes the costs of maintaining the water supply for mine, plant and dwellings.

613. *Lighting* expense includes the costs of operation and maintenance of all electric or other lighting by the company.

614. *Telephones* expense includes the cost of operating and maintaining the telephone system.

615. *Roads* expense includes the costs of upkeep of roads and trails.

616. *Tools account:* All tools issued from stock for general use are charged to this account. Records of tools loaned and returned are kept at the warehouse and lost tools are charged to the workmen to whom they were issued.

617. *Shop expense:* Whenever possible, the work done in the shops is charged out directly to the proper accounts. Any charges which remain, as the maintenance of shop machinery, power, etc. are included under this account.

618. *Surface foremen and bosses:* Foremen and bosses employed on general work, so that their time cannot readily be distributed, are charged to this account.

619. *Genl. miscellaneous:* Items not chargeable to other accounts are included under the heading of General Miscellaneous expense. In order to avoid the danger of making this account the dumping ground for careless distribution, an itemized monthly statement of the charges included in it should be required.

Indirect Charges.

A. Hoisting expense is charged with the costs of operation and maintenance of the hoisting equipment; also with the wages of station tenders, top-landers, etc. The account is redistributed upon the basis of the actual number of cars hoisted.

B. Drills & compressors: This account is charged with the operation and repairs of mine compressors and with the upkeep of machine drills. Redistribution is made upon the basis of the number of machine shifts performed to each class of work. New machine drills may be charged out as a subaccount under Construction & Improvements when they are issued from the warehouse, their value being written off as depreciation upon the basis of the estimated length of life of the drill.

C. Tool sharpening: This account may be subdivided

according to the actual number of drills sharpened for each class of work; a simpler way is to make the redistribution in proportion to the charges for breaking ground to the mine accounts between which it is divided.

P. Power expense is also a redistributable charge, but it should appear as a separate account as its redistribution includes charges to the other indirect accounts. This account includes all costs of the operation and maintenance of power plant and appurtenances. It is charged out to the accounts benefitted upon the basis of the actual power consumption in the various departments. The redistribution is arrived at from wattmeter or other readings, or from the manufacturers' ratings of the machines in use.

Current Capital Charges.

The Capital Charges include all expenditures which are made for permanent improvements or additions to the property. The value of all such improvements and additions is systematically written off to Profit and Loss as depreciation, usually at the end of each year, over a period of time decided upon as the probable useful length of life of the installation.

7. Live Stock & Vehicles. This account covers the value of all live stock, harness, wagons, motor vehicles, etc.

8. Furniture & Fixtures. This account covers the value of all house and office furniture and fixtures.

9. Constructions & Improvements. This account covers the value of all constructions, improvements and additions in equipment. A separate subaccount is opened under this heading for each new construction or installation.

Suspense Accounts.

Taxes Suspenses. The taxes for the year are anticipated and are charged off to the operating expenses in equal monthly installments. Any differences between the estimated and the actual amounts are adjusted at the end of the year.

Insurance Suspense. Insurance premiums are paid in advance, and the amount paid out for this purpose is charged

into a suspense account. The total cost of insurance is then charged out to General Expense in twelve equal monthly installments during the year, the suspense account being closed out by the December entry. *Example:*

	Insurance Suspense		Cash		General Expense	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
(1)	$3900			$3900		
(2) Jan.		$325			$325	
(3) Feb.		325			325	
(4) Mar.		325			325	
(12) Nov.		325			325	
(13) Dec.		325			325	
	Closed			$3900	$3900	

Other General Ledger Accounts.

HEAD OFFICE. This account is credited with all remittances and payments of bills made for the account of the mine by the head office; it is charged with all income from the sale of bullion or from other sources. The funds necessary for current expenses are furnished by the head office, either as bank deposits to the credit of the mine account or as payments of bills. Entries for these transactions are made upon the mine books as follows:

Upon receiving advice from the head office of a deposit at the bank of say $10,000 and of payments of bills for supplies purchased to the amount of $3,625:

Head Office		Cash		General Supplies	
Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
	$13,625	$10,000		$3,625	

Upon making shipment from the mine of bullion, valued by mine assays at $38,500:

Head Office		Bullion	
Dr.	Cr.	Dr.	Cr.
$38,500			$38,500

Suppose that the actual liquidation received from the sale of the above bullion shipment is $38,800, or $300 more than the estimated value already entered upon the books. Then $300 is charged to the Head Office Account and the Bullion Account is corrected to show the actual value of the shipment:

	Head Office		Bullion	
	Dr.	Cr.	Dr.	Cr.
(1)	$38,500			$38,500
(2)	300			300
	$38,800			$38,800

Bullion. This account shows the bullion production for the year to date. The value of each shipment is estimated as already explained, a correction being made later, when the actual liquidated value has been received. The Bullion Account is credited to Profit and Loss to the end of each year.

Cash. The Cash Account constitutes the record of all cash received and paid out, and of the cash balance, on hand or deposited in the bank. The account includes money and commercial paper, as checks, drafts, etc., which is redeemable at face value upon presentation. The Cash Account is debited with money received and credited with money paid out. The account may be separated into several accounts, in order to show transactions from actual cash-on-hand, and also transactions with each bank with which the company carries a deposit.

Accounts Payable. This account represents the total of bills owed by the company; the total of the account is the

total amount of the credit sides of the Individuals & Cos. Ledger and Invoice Record.

Accounts Receivable. This account represents the total of bills owing to the company; it is made up of the total of the debit sides of the Individuals & Cos. Ledger and Invoice Record.

General Supplies. This account is charged with the materials and supplies received at the warehouse and credited with the materials and supplies issued; it should show at the end of each month the value of stock on hand. The account is adjusted after inventory to show the actual value of stock, the difference being charged out to Profit & Loss or charged pro-rata to the various accounts.

Unclaimed Wages. Employees' wages not claimed within a reasonable length of time are returned to the cash and credited to this account. If these wages are paid later, the account is charged with the amount.

Profit & Loss. At the end of each year, all operating expenses, losses and depreciation are charged off to the Profit & Loss Account; the bullion production and income from all other sources are credited to it.

CHAPTER THREE

OUTLINE OF PRINCIPAL RECORDS USED

A brief general outline of the system of records to be described in the following pages will assist in giving a clear understanding of the uses of each record and of its relation to the general system. To prevent confusion, only the more essential records will be listed in this summary, as the uses of the others will be understood without difficulty if the purpose of each principal record is made entirely plain. In the outlines at the beginnings of the following chapters, the records which are essential to a complete system are listed apart from the secondary ones, which may be required as auxiliaries to the principal records or to furnish additional information to aid in following the details of the work.

Essential Records.

General Office Records of Accounts.

Cash Journal
Vouchers
General Distribution
General Ledger

Time-keeper's Records.

Time Book
Labor Distribution
Pay-rolls

General Office Records of Supplies.

Purchase Orders
Register of Supplies Ordered
Cost Book

Warehouse Records.

Stock on Hand Index
Warehouse Requisitions
Supplies Distribution

GENERAL OFFICE RECORDS OF ACCOUNTS

Cash Journal.

The Cash Journal takes the place of Cash Book, Journal and Voucher Register. All transactions, both expenditures and receipts, are recorded in this book, in which columns are provided for debiting and crediting the amount of each entry to the accounts concerned. The charges and credits to each account are then added up at the end of the month and are posted as one entry to that account in the General Ledger.

Vouchers.

The Voucher furnishes a statement in detail concerning the purpose of the corresponding transaction. A receipted Cash Voucher should be on file for every disbursement as recorded by the Cash Journal; a Journal-entry Voucher is only necessary when the space afforded by the Cash Journal is too limited to give full details concerning the journal entry.

General Distribution.

The Cash Journal only distributes each transaction to the General Ledger accounts, which are the main headings in the outline of accounts as given in Chapter Two. The distribution of current expenditures to the various subaccounts is carried out on the General Distribution sheet; this record furnishes the information for making up the monthly Cost Statements. The General Distribution record is *only* concerned with the items which go to make up the operating expenses and current capital charges; no other entries appear upon it.

General Ledger.

The Ledger constitutes the permanent record of the general accounts in their final form.

TIME-KEEPER'S RECORDS

Time Book.

The Time Book shows the hours worked by each employee and charges out this time to the various jobs upon which he was employed.

Labor Distribution.

The daily labor charges as given by the Time Book are classified to the accounts benefitted upon the Labor Distribution sheets, which segregate the costs of every class of labor to each job and operating account. Labor costs for any account can be analysed at once by referring to the corresponding Labor Distribution sheet.

Pay-rolls.

The Pay-rolls are posted daily from the Time Book; at the end of the period, they show the gross earnings, deductions and net balance due to each employee.

GENERAL OFFICE RECORDS OF SUPPLIES

Purchase Orders.

Orders for warehouse stock to be purchased are made out upon this form.

Register of Supplies Ordered.

This record assembles all information concerning supplies and materials purchased and furnishes the cost of each item as delivered at the warehouse.

Cost Book.

The cost price per unit of each article of warehouse stock is given in the Cost Book; it also contains the Purchase Order numbers applying to each article, thus serving as an index to the Register of Supplies Ordered.

WAREHOUSE RECORDS

Stock on Hand Index.

The daily receipts and issues of supplies are entered upon this index, which furnishes a perpetual inventory of the warehouse stock on hand.

Warehouse Requisitions.

The Warehouse Requisition constitutes the warehouse clerk's receipt for supplies issued. A separate slip is used in making a requisition for supplies to each subaccount. The requisitions are then segregated and filed under the headings of the subaccounts.

Supplies Distribution.

The Supplies Distribution sheets classify the supplies used for each job and operating account; they are posted from the Warehouse Requisitions. Material costs for any account can be analysed at once by referring to the corresponding Supplies Distribution sheet. The items making up any charge upon the sheet are immediately accessible from the corresponding Warehouse Requisitions, which have been segregated and filed to each subaccount.

CHAPTER FOUR

GENERAL OFFICE RECORDS

Essential Records:	Subsidiary Records:
Cash Journal	Petty Cash
Vouchers	Individuals & Companies Ledger
General Distribution	Invoice Record
General Ledger	Side Ledger of Capital Charges

Cash Journal (Figs. 1*a* & *b*).

The present tendency is to get away from posting and copying accounts through Cash Book, Journal and Voucher Register by the use of a single book, known as the Cash Journal. By the use of this record, the charges to the various accounts are segregated and balanced before they are posted to the General Ledger. Instead of the laborious repetition required in posting through the Journal, only the total amounts of the accounts which are much in use are transferred to the General Ledger at the end of the month.

The Cash Journal should contain a sufficient number of columns, so that ordinary transactions can be debited and credited at once to the proper accounts; this avoids the necessity of posting each entry to the General Ledger. In the application of the classification of accounts already outlined, columns should be provided for the following:

DEBITS

Individuals & Companies
Cash
Bank
Store Expense } These accounts are needed only in case that the company operates a general mercantile store.
Merchandise }
General Supplies
Various (Each item must be entered to the General Ledger)
Constructions & Improvements
Power } These are closed out at the end of the month to the other accounts.
Indirect Charges }

MARKETING BULLION
ORE TREATMENT
MINE GENERAL
STOPING
DEVELOPMENT
DEAD WORK

CREDITS

INDIVIDUALS & COMPANIES
VARIOUS (Each item must be entered to the General Ledger)
GENERAL SUPPLIES
STORE (This account is used only when the company operates a store).
CASH
BANK

The above headings will be found to handle nearly all entries. At the end of the month the columns are added and the Cash Journal is balanced. The total of each account is then posted to the General Ledger. The ideal Cash Journal would have a column for every ledger account, thus avoiding the posting of any individual entry to the General Ledger, but this would necessitate a volume of unwieldy dimensions. In order to keep the record to as small size as possible, accounts only occasionally used are entered through the "Various" columns and each entry to these accounts must be posted separately to the General Ledger. Bills owed by, and owing to, the company are posted to the subsidiary ledger known as "Individuals and Companies."

Transactions of all kinds, which have a place in the accounts, are entered upon the Cash Journal. Any case which may arise can be handled by this record, if the form in use has been adapted to the requirements. The Cash Journal can easily be introduced into any bookkeeping system, to replace Cash Book, Journal and Voucher Register. By carrying it for a time with the records which it is intended to supercede, upon forms ruled by hand or printed upon black-process paper, the most effective arrangement of headings will be determined. A few blank columns should be provided for new accounts which may be needed. Figs. 1 *a* & *b* show a form of Cash Journal with examples of entries. Some of the examples are given below in diagram:

CASH JOURNAL

Debits

		Dead Work 0	Devel-opment 1	Stop-ing 2	Mine Genl 3	Ore Treat-ment 4	Markt'g Bullion 5	Genl Exp. 6	Indirect Charges ABC	Power P	Constr & Impr 9	Various Account	Folio	Amt	General Supplies	Merch-andise	Store Exp.		Cash	Bank	Inds & Cos
															187						
																				12000	
								22													
								19													
						10		102													
		753	812	1001	330	3367		314	256	117	656										
								300													
		1257	1343	2650	713	1765	25	1907	556	320	375										
								37								47					11
																					6
																					1
			10			390		40	410												
		275	325	750																	

FIG. 1a.—Cash Journal.

Month of June 19—

Credits

Individuals and Companies	Folio	Inds & Cos.	Voucher No.	Date	Entry	Various Account	Various Folio	Various Amt.	General Supplies	Store		Cash	Check No.	Bank
			C367	7	Denver Fire Clay Co. *Assorting Supplies*								1242	187
				15	Deposited for current expenses	Head Office	6	1500 00						
			C418	19	George Rogers-wood for boarding house					10			1273	13
John Stanley	34	19	J77	21	Traveling expenses of Supt.									
			J81	21	Store issues to current accts.					279				
			J82	21	Warehouse issues				7369					
				21	Proposition of taxes for June	Taxes Expense	19	300						
			J83	21	Payrolls for June	General Expense	19	334		5931			1275 1276 1277	2263
John Stanley R E Sargent E F Smith Robert Campos C A Burgess A Frederick	34 35 36 37 38 39		C529	21	Petty Cash - to R.G.Sanford, Cashier								1284	122
			J84	21	Redistribution of Power	Power	47	150						
			J85	21	.. Other Indirect Charges	Indirect Charges	58	1350						

FIG. 1b.—Cash Journal.

Entry: To the Denver Fire Clay Co., for assaying supplies, $187

Debit		Credit	
General Supplies	$187	Bank Account	$187

Entry: Deposited by head office for current expenses, $15,000

Debit		Credit	
Bank Account	$15,000	Head Office	$15,000

Entry: To George Rogers, for stove wood, $22

Debit		Credit	
General Expense	$22	Store	$10
		Bank Account	12

Of the total amount, $22, $10 was drawn in goods from the company store and $12 was paid by check.

Entry: To John Stanley, Supt., for traveling expenses, $19

Debit		Credit	
General Expense,	$19	Individuals & Co.'s	
		John Stanley	$19

The account of John Stanley, Supt., is credited with $19 in the Individuals & Companies ledger.

Entry: Store issues to current accounts, $179

Debit		Credit	
Ore Treatment	$ 10	Store Account,	$179
General Expense,	169		

etc.

It will be noted that the Cash Journal carries out the distributions to the Ledger Accounts only; the further distribution to the various subheadings under each Ledger Account is made upon the General Distribution sheet, which will be considered in this chapter.

Petty Cash Book (Fig. 2).

To avoid entering cash payments and receipts for trifling amounts into the Cash Journal, a Petty Cash Book, into which these entries are made, should be kept. At the end of the month the total balance from the Petty Cash Book is posted to the Cash Journal as one entry. A simple receipt form should be used for petty cash payments; these receipts are filed with the Cash Voucher which accompanies the entry to the Cash Journal.

PETTY CASH BOOK.

Date	Entry	Distrib'n	Dr.	Cr.
	Forward			$19 40
July 12	Telegrams	61	....	2 20
	Eggs for boarding house	68	....	1 75
	Reward for finding strayed stock	610	....	2 00
July 14	Postage stamps sold	61	2 25	

FIG. 2.—Petty Cash Book.

Vouchers.

(1) *Cash Vouchers.* Every cash disbursement as entered upon the Cash Journal must be accompanied by a corresponding Cash Voucher, which serves as a receipt for the amount paid out, as well as a detailed record of the transaction involved; upon it should be given a complete statement of the purpose for which the expenditure was made. A convenient development of the Cash Voucher is the Voucher Check (Figs. 3 *a* & *b*), which combines the Cash Voucher with the bank check by which payment is made. This form of voucher requires no receipt other than its indorsement when cashed; the cancelled check as returned from the bank constitutes the record of the transaction. A stiff paper envelope (Fig. 4), about 4½ × 9 inches, open at the end and with a printed form for entering the voucher number and the date, will be found convenient for filing the voucher and the invoices or other documents which accompany it. Distribution to the various accounts benefited by the expenditure may be shown upon this envelope or upon the voucher itself. The usual practice

Mary Mining Company

Check No. *1942* Cash Voucher No. *387* Bearcat, N.M. *June 7, 192-*

FIRST NATIONAL BANK

Pay to the order of *Denver Fire Clay Co.* $ *187.00*

One hundred eighty seven 00/100 Dollars

Cashier Superintendent

By the indorsement of this voucher the payee acknowledges payment in full settlement as stated within.

Make all indorsements here:

FIG. 3a.—Voucher Check (face).

MARY MINING COMPANY
Bearcat, New Mexico

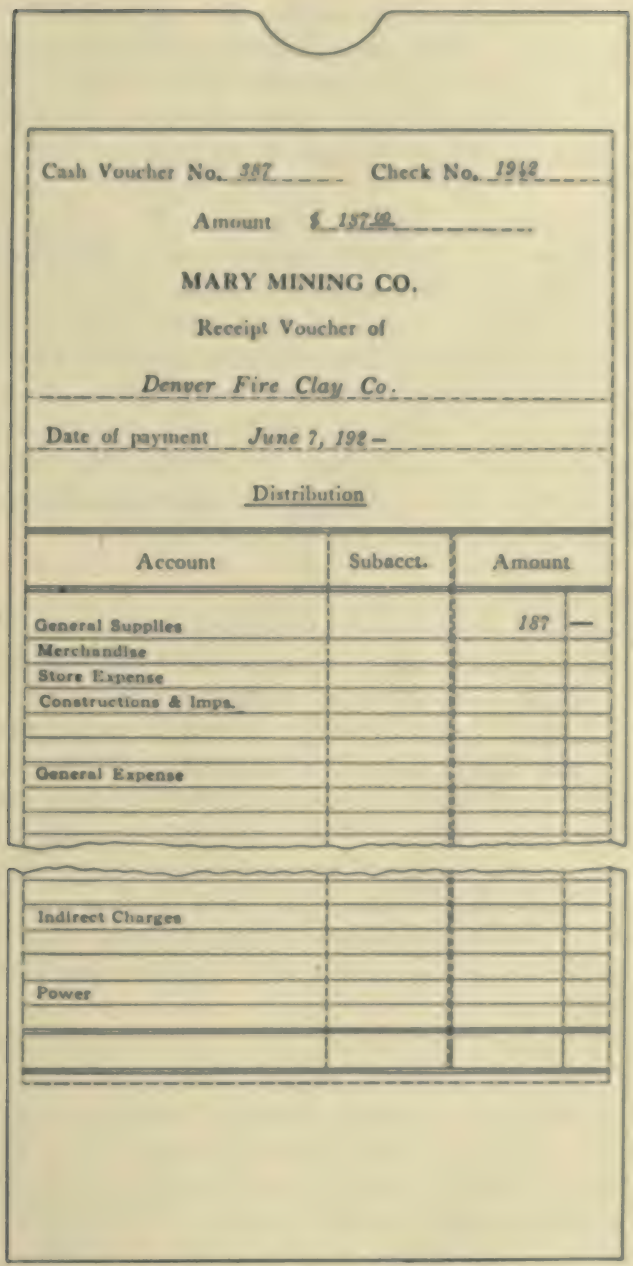
Cash Voucher No. *387*

To *Denver Fire Clay Co.*
Denver, Colo. Dr.

Purpose of Payment					
May 17	*Invoice for assaying supplies*	*85*	*70*		
" 29	*" " " "*	*101*	*30*		
	Total			*187*	*00*

Indorsement should be made on reverse side. No other receipt is required. Deposit in any bank for collection.

FIG. 3b.—Voucher Check (reverse).



Cash Voucher No. 387 Check No. 1942

Amount $ 187.00

MARY MINING CO.

Receipt Voucher of

Denver Fire Clay Co.

Date of payment *June 7, 192–*

Distribution

Account	Subacct.	Amount	
General Supplies		*187*	—
Merchandise			
Store Expense			
Constructions & Imps.			
General Expense			
Indirect Charges			
Power			

FIG. 4.—Envelope for filing cash voucher and invoices.

is to require all bills and invoices to the company to be made out in duplicate. After an account has been paid, the cancelled check and the original papers are filed into a voucher envelope and forwarded to the head office; the duplicate bills are also filed into an envelope and are kept for record at the local office.

(2) *Journal-entry Vouchers* (Fig. 5). All journal entries are made directly to the Cash Journal; unless the transaction is so simple that it will be readily understood by the entry as made upon the Cash Journal, it should be accompanied by a Journal-entry Voucher, which states the purpose of the entry in full detail. The explanation of the entry as given upon the Journal-entry Voucher should be such that the transaction will be clearly understood by anyone who may have occasion to refer to it. The Journal-entry Vouchers should be filed into loose-leaf binders for reference.

General Distribution (Figs. 6 *a* to *g*).

The purpose of the General Distribution sheet is to classify to the proper subaccounts all charges which make up the total current monthly expenditures for general operations as they appear upon the Cash Journal. It will be noted that this record is only concerned with the current charges to both the operating and capital accounts; all other entries are made to the Cash Journal alone. Thus all entries to Operating Expenses and to the Current Capital Charges, in the outline of accounts given in Chapter Two, will appear upon both the General Distribution and the Cash Journal, while entries to the other ledger accounts will appear upon the Cash Journal only.

The General Distribution form is made loose-leaf; to avoid a sheet of unwieldy length, it may be made up of several short sheets, securely fastened together in the form of a book, with the bottom leaf sufficiently longer than the others that the statement of the entries and the total amounts, which appears in the columns at the left hand side of the page, will not be covered when the form is closed. Every subaccount must be given a column upon the General Distribution, and the number as well as the name of each subaccount

Journal Entry No. 78 Date: June 30, 192-

To Mercantile Store **Credit**					
Issues during June to the following accounts:					
ORE TREATMENT					
42 20 cotton grain sacks ×$0.35		7	00		
44 3–2 gal. galvanized pails ×$1.00		3	00		
GENERAL EXPENSE					
62 2 bars soap ×$0.10	$0.20				
5 yds. cheese cloth ×$0.16	0.80	1	00		
63 300 paper bags	1.50				
2 towels × $0.75	1.50				
2½ doz. tin pans ×$0.10	3.00	6	00		
68 General Merchandise		160	00		
611 2 paint brushes × $1.00		2	00	179	00

ENTERED FOLIO 58 CORRECT APPROVED

FIG. 5.—Journal-entry Voucher.

Month of June 192– GENERAL DISTRIBUTION

Voucher No.	Date	Entry	Amount	Dead Work					Development					Stoping					
				Breaking Ground 01	Tramming 02	Timbering 05	Pumping 06	Total	Breaking Ground 11	Tramming 12	Timbering 15	Pumping 16	Total	Breaking Ground 21	Tramming 22	Shovelling 23	Filling 24	Timbering 25	Total
		Labor																	
J85	31	*Payrolls for June*	10905	876	331	50		1257	945	320	50		1345	1540	459	132	370	143	2650
		etc																	
		Supplies																	
C41?	19	*Stovewood for boarding house*	22																
J81	31	*Store issues*	179																
J82	31	*Warehouse issues*	7909	622	21	110		753	648	23	144		815	742	30	9	14	206	1001
C43?	31	*Petty Cash*	57																
		etc																	
		Sundries																	
J77	21	*Traveling expenses*	15																
	31	*Taxes*	300																
		etc																	

FIG. 6a.—General Distribution.

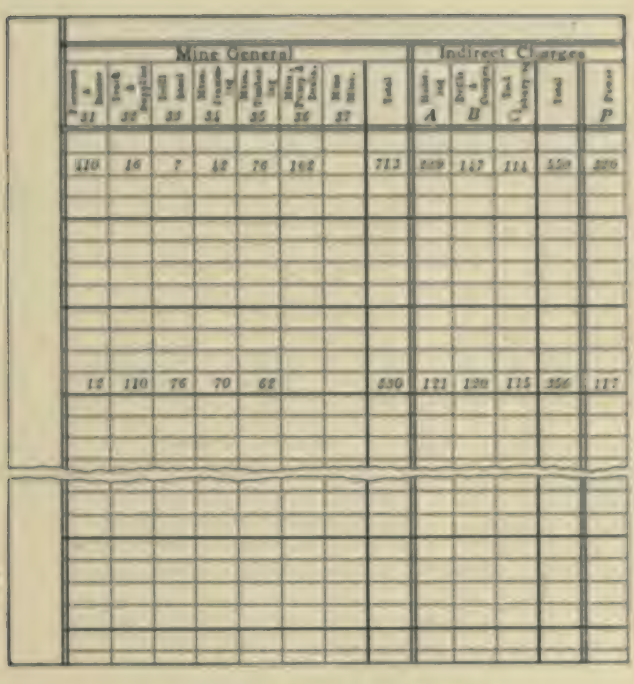


Fig. 6b.—General Distribution.

GENERAL DISTRIBUTION												
Milling									Cyaniding			
Crude Ore 41	Concentrates Retreated 42	Slimes 43	Amalgamation 44	Supplies 45	Gold Bullion 46	Silver 47		Total	Gold Bullion 411	Concentrates 412	Sands 413	Slimes 414
57	879	317	237	200	54			1144	17	52	86	94
	7		3					10				
24	28	1242	57		5			1356		287	676	71

Fig. 6c.—General Distribution.

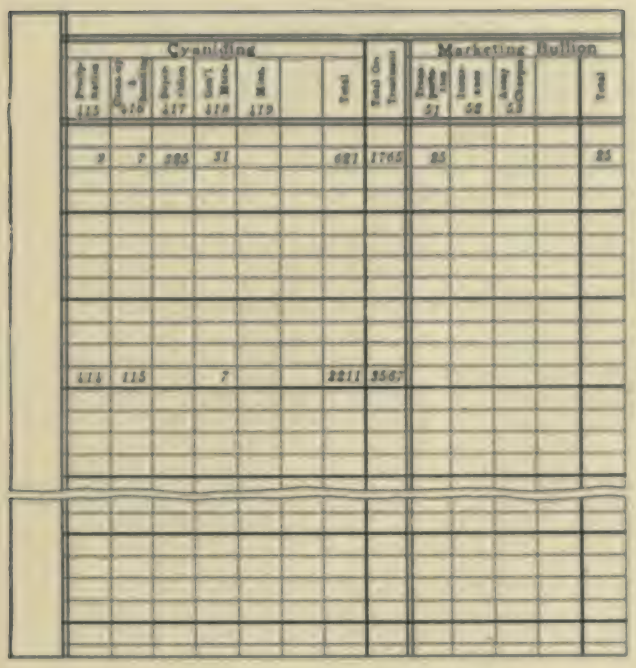


Fig. 6*d*.—General Distribution.

GENERAL DISTRIBUTION

	General						Expense					
Gen'l Office 61	Engineering 62	Assay'r & Samp'r 63	Stenographer 64	Legal 65	Taxes 66	Ins. 67	Boarding House 68	Prospecting 69	Stable 610	Bldg. Mtce. 611	Water Supply 612	Light. Ins. 613
1040	175	157	84	75			56	73	56	29	10	29
							22					
	1	6					160			2		
	2	4								69	7	29
8							17		12			
					300							

FIG. 6e.—General Distribution.

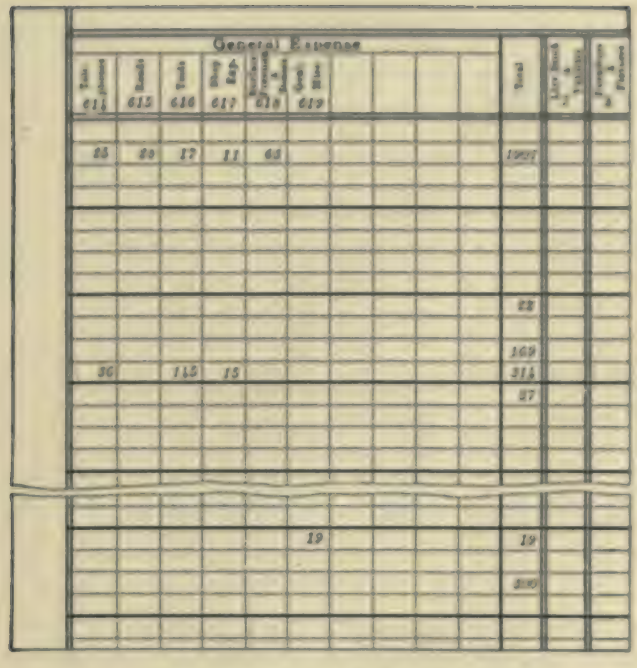


FIG. 6f.—General Distribution.

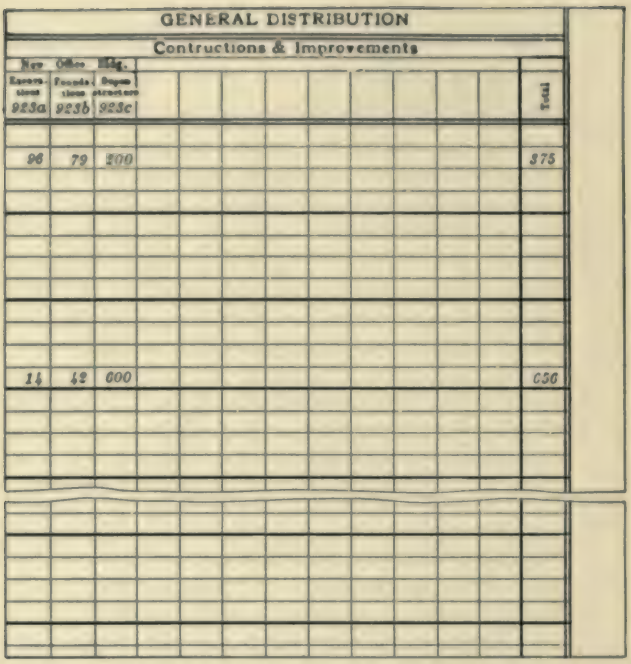


FIG. 6g.—General Distribution.

should appear at the head of the column to facilitate finding it readily. The costs of labor, supplies and sundries should be kept separately. "Sundries" include all charges which are for neither labor nor supplies, as payments for taxes, fees, miscellaneous credits for medical dues, house rents, etc., etc. In order to separate the costs of labor, supplies and sundries to each account, the charges should be segregated upon the General Distribution sheet; that is, all labor entries, for example, should be made together upon one part of the sheet, etc. Practice will soon determine the approximate number of spaces required under each caption. A few blank columns should be provided for new accounts which may be needed. Credit items are entered in red ink. The total charges to each account, as taken from the General Distribution sheet, are used to make up the monthly Cost Statements, the forms for which are considered in Chapter Eight.

Redistributable Accounts.

After all entries for the month have been made upon the General Distribution, the Indirect Charges are redistributed. The charges to labor, supplies and sundries to each indirect charge are apportioned to the accounts benefited and the corresponding amounts under Indirect Charges are closed out in red ink.

Constructions & Improvements.

In keeping costs of installations and construction work, the expenditures for the various operations which make up the completed job should be determined. Excavations and grading, foundations, superstructures, wiring, painting, etc. should be kept as separate items; these details furnish information to be applied to similar work in the future and some of them are necessary for insurance purposes. Each item of construction which is to be determined is given a column under "Constructions & Improvements" upon the General Distribution; these columns are in blank to be filled in as needed. The job is indicated in the narrow blank space above the spaces for the names of the subaccounts. The monthly charges to each construction job are entered into

the Side Ledger of Capital Charges to make up the cost record of the completed job. The total charge to the General Ledger account, "Constructions & Improvements," from the General Distribution, appears as one entry for the month in the General Ledger.

General Ledger (Fig. 7).

The General Ledger is the final record of the major accounts; all entries to it are posted from the Cash Journal. The General Ledger may be permanently bound or loose-leaf, and is of the standard form which can be purchased almost anywhere. An account is opened in the General Ledger for each one of the major headings as given in the general outline of accounts, a page in the ledger being given to each account. To make the subject clear, these General Ledger accounts are repeated:

GENERAL LEDGER ACCOUNTS:

Dead Work	Taxes Suspense
Development	Insurance Suspense
Stoping	Head Office
Mine General	Bullion
Ore Treatment	Cash
Marketing Bullion	(Bank)
General Expense	Accounts Payable
Indirect Charges	Accounts Receivable
Power	General Supplies
Live Stock & Vehicles	Unclaimed Wages
Furniture & Fixtures	Profit & Loss
Constructions & Improvements	

At the end of each month, the columns in the Cash Journal are balanced; these totals are then posted to the corresponding accounts in the General Ledger. Only one monthly entry to each active account is required, with exception of the entries made under the "Various" columns; each item of these must be posted separately to the General Ledger. When all entries for the month have been made from the Cash Journal, the General Ledger must balance; i. e., the total debits of the ledger must be equalled by the total credits. The balanced

Account ORE TREATMENT

Debit				Credit			
		Folio				Folio	
Jan. 31	*Cash Journal*	4	6220.50	Dec. 31	*Profit & Loss*	40	72846.76
Feb. 28	do	8	6739.20				
Mar. 31	do	11	4976.41				
Apr. 30	do	14	5884.17				
May 31	do	17	6150.49				
June 30	do	20	6023.12				
July 31	do	24	6336.10				
Aug. 31	do	27	5784.00				
Sept. 30	do	30	5919.07				
Oct. 31	do	33	6540.50				
Nov. 30	do	36	6441.17				
Dec. 31	do	40	5832.23				
			72846.76				72846.76

FIG. 7.—General Ledger.

statement of the General Ledger Accounts, showing that the total debits and total credits are equal, is called the "Trial Balance."

Individuals & Companies Ledger.

Miscellaneous open accounts with company employees and outsiders are usually kept in a separate ledger record known as "Individuals and Companies." This record is really a part of the General Ledger and all the accounts may be carried in the General Ledger if desired. Accounts with concerns who bill out their goods by invoice should not be entered upon the Individuals and Companies Ledger; these are more easily handled by the use of an additional ledger form, known as the "Invoice Record." The total debits and credits from the Individuals and Companies Ledger and the Invoice Record make up the General Ledger entries to Accounts Payable and Accounts Receivable.

Invoice Record.

The Invoice is a statement covering the purchase price of goods shipped to the company; the shipper mails an invoice for each consignment of goods as shipment is made; at the end of the month, he renders a statement covering the total amount due to date. The Invoice Record is a simple ledger form, into which the invoice amounts are posted directly, after the invoice has been approved for payment, thus avoiding the necessity of making entry for each invoice through the Cash Journal. When settlement is made after the end of the month, the account in the Invoice Record is closed out and entry covering the payment is made in the Cash Journal.

Side Ledger of Capital Charges. (Fig. 8).

The object of this record is to furnish the details of all charges to the current capital accounts and to provide means by which these accounts may be systematically charged off to depreciation. Each job is carried upon a separate sheet in this record; when the work is completed, the record of it is filed alphabetically into the back of the book for future refer-

Item—Head Frame at Shaft No.3

Date		Labor	Supplies	Sundries	Power	Total	Deductions	Value on Books
Dec. 19-	*Foundations*	*24.70*	*32.95*			*57.35*		
"	*Structure*	*297.40*	*134.15*			*431.55*		
"	*Sheave & bearings*		*42.50*			*42.90*		*531.80*
Dec.31,19-	*Depreciation*						*132.95*	*398.85*
Dec.31,19-	*"*						*132.95*	*265.90*

FIG. 8.—Side Ledger of Capital Charges.

ence. All pieces of machinery, etc., which may be used later at some other place than that where they were first installed, as hoists, motors, pumps, etc., are separated out from the installation for which they are intended and the cost of each piece of machinery, etc., as delivered at the property is kept as a separate record. In this way, no confusion will arise later in making charges for additions and improvements, or for depreciation.

The monthly charges to the various capital accounts are posted to this ledger from the General Distribution; the details of the charges for labor and supplies are given upon the Labor and Supplies Distribution sheets, so that a complete analysis of all capital charges is immediately available by referring back to these records. Labor and Supplies Distribution records are considered in Chapters Five and Seven. The charges to depreciation are segregated from the Side Ledger of Capital Charges, and the total amount of depreciation allowed for any period is charged off to Profit and Loss in the General Ledger.

CHAPTER FIVE

TIME-KEEPER'S RECORDS

Essential Records:	Subsidiary Records:
Office Time Book	Foremen's Time Books
Labor Distribution	Time Tickets
(Pay-rolls)	Pay Envelopes or
	Voucher Pay-checks

Office Time Book (Fig. 9).

The name of each workman is given a page in this form of time book; the record should be loose-leaf and so constructed that the sheets can readily be transferred in it from one place to another as desired.[1] In this way, each class of labor can be segregated in the time book to facilitate the daily distributions; that is, the carpenters, the blacksmiths, the laborers, etc. can be kept together, and each class of labor indexed in the book by a tabbed sheet for ready reference. The time of the workman is usually noted in hours and his rate given as a rate-per-hour. The jobs upon which he worked are indicated by number. At the end of the period, the total time worked and the total amount due each workman are extended in the time book as a check against the pay-rolls. The usual practice is to count time worked in half hours; if the workman comes on shift a few minutes late, a half hour is deducted from his time for the day. In all examples of time-keeping records shown, payments twice monthly have been assumed. Time records should be printed for the 1st to 15th of the month and others for the 16th to 31st, to avoid unnecessary clerical work; or the dates for both periods may be printed in the title spaces and a line drawn through the figures not used.

Workmen's time is usually kept at the time-keeper's office by time-clocks or by a check system. Where the check system is used, a metal identification check, stamped with the workman's number, is issued to each man from the time

[1] Ref. "Engineering Office Systems and Methods" by John P. Davies; McGraw-Hill Book Co.

office. Before the beginning of the shift, the check is handed in at the office, where here it is hung in its place upon a board; at the end of the shift, the check is returned to the workman as he passes the window. These checks also serve as a means of identification at the store, the paymaster's window, etc.

Name Chas. White — Employee's Number 428

Occupation	Acct.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total hours	Rate	Amount
Blacksmith	C	8	4	6	8	2													
	32		4																
	34			2		4													
	42					2													

Fig. 9.—Office Time Book.

Foremen's Time Books (Fig. 10).

A pocket-sized time book may be supplied to each foreman, in which the time of his men is kept. A page in this book is assigned to the name of each workman and sufficient spaces are provided for the total number of days during the period. The daily hours worked by each man are noted in the book, his time being divided up to show the number of hours put in on each class of work or job. The book is delivered at the end of the shift to the time-keeper for posting the time and distributions to the Office Time Book.

Time Tickets (Fig. 11).

Instead of the Foremen's Time Book, an Individual Time Ticket form may be used for keeping account of the work

Name—Arturo Castro No. 237

Occupation—Machine runner Month June, 192—

Date	Hours	Work performed	Acct.
1	*8*	*Drilling, 1200S Heading*	*11*

Fig. 10.—Foremen's Time Book.

Name—Fred Fiske No. 129

Occupation—Timberman Date—June 1, 192—

Hours	Work performed	Acct.
7½	*Retimbering on 900 level*	*35*

In 7.10 Out

Mining Department

Foreman

Fig. 11.—Time Ticket.

performed. A blank form, stamped with the date, is issued from the time-keeper's window to each workman as he goes

on shift; the form is filled in and signed or punched by the foreman during the shift; it is then returned to the time-keeper at the end of the day. Many workmen, especially those employed in the higher classes of labor, will be able to make out their own tickets after they have been shown what is required, as each ticket must be approved by the foreman before it is returned. Credit for time worked will depend upon the return of the ticket properly made out, so that little difficulty in that direction will be experienced. Time tickets are often used in the shops, where a workman may be employed upon a number of jobs during the day and the workman himself can best account for the time put in on each job, pocket time books being used for mine labor and for miscellaneous labor employed upon surface.

Labor Distribution (Fig. 12).

The first object of this record is to apportion the labor roll among the various accounts, for entry upon the General Distribution at the end of the month. It also affords a statement of the costs of each class of labor which make up the daily expenditures to each account. A separate sheet, or a part of a sheet as required, is kept by the time-keeper for each active account, and the total charge to each class of labor is posted to it daily from the Office Time Book. The totals of the Labor Distribution for the period must check with the corresponding pay-rolls. At the end of the period, the sheets should be filed under the headings of the accounts rather than by months, so that the itemized labor cost for performing any completed operation will be readily accessible. The Labor Distribution furnishes the essential information for the analysis of costs as shown by cost statements, and a variation in the cost of labor for any class of work can be located immediately.

Force Account Pay-rolls (Fig. 13).

The time worked by each employee is posted daily to the pay-rolls from the Office Time Book. Fig. 13 shows a form of pay-roll for workmen who are employed by the company. It often occurs that a workman will be employed at several

LABOR DISTRIBUTION		Month of October, 192—													Account ÷ Mine General		
Sub-acct	Class of Labor	1	2	3	4	5	6	7	8	9	10	29	30	31	Salaries	Total
31	*Mine foreman*														250 00	
	Shift bosses	9 50	9 50	9 50												
32	*Blacksmiths*	2 50		5 60												
	Laborers		4 80	3 00												
33	*Blacksmiths*		2 75													
34	*Trackmen*	7 00	7 00	7 00												
	Car repairer	3 20	3 20	3 20												
35	*Timbermen*	6 20	9 10	6 20												
	Carpenters		4 00													
37	*Laborers*	4 80		1 80												

Fig. 12.—Labor Distribution.

Surface Pay-roll

No.	Name	Occupation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
137	*John Jones*	*Laborer*	*8*	*8*	*8*	*8*	*8*		*8*	*8*	*7*	*8*	—	*8*	—	*8*	*8*
138	*Thos. Wilson*	*Laborer*	*8*	*8*	*8*	*8*	*8*										
		Straw boss							*8*	*8*	*8*	*8*	*8*	*8*		*8*	*8*

Period February 1-15, 192-

Total Hours	Rate	Total Amount	Store	Warehouse	Hospital	Hotel	Other Deductions: Account	Other Deductions: Amt.	Total Deductions	Balance Due	Remarks
95	*30*	*28 50*	*6 00*		*30*				*6 30*	*22 20*	
40	*30*										
64	*40*	*37 60*	*22 00*		*40*		*House Rent*	*5 —*	*28 40*	*9 20*	

Continued from above

FIG. 13.—Force Account Pay-roll.

occupations and rates during the period and the form of pay-roll should provide for this case, without having to enter the same name more than once upon it. At the end of the period, the hours are totaled and the gross amount due is calculated; these figures are checked with the totals as they appear upon the Office Time Book. The charges for mercantile store account, warehouse supplies, hospital fees, etc. are deducted from the gross earnings and the net balance is extended upon the pay-roll for settlement.

Contractors' Pay-rolls (Figs. 14 *a* & *b*).

While contractors are often paid the total net amount due for their work, from which they pay the wages of their men, the practice of keeping the time of contractors' men and of paying them from the office is to be recommended. In this way, the net earnings of the contractor are definitely known to the management and the contract prices can be fixed intelligently. This practice will also prevent the contractors from paying disproportionately high wages, in an effort to secure the best workmen, a common source of demoralization when both contractors' and day's pay men are employed. Upon the form shown for Contractors' Payroll (Figs. 14 *a* & *b*) the total amount due the contractor is calculated in the spaces at the top of the sheet. The hours worked by the contractor's men are entered below and their gross earnings are extended as a deduction against the contractor, whose name appears at the bottom of the sheet. The columns for other deductions are the same as those upon the Force Account Pay-roll form.

Pay Envelopes.

Where wages are paid in cash, the net balances from the pay-rolls should be placed into envelopes for payment, to prevent mistakes in handling. The pay envelope should show upon it a clear statement of the number of hours worked, with rates and deductions for the information of the workman.

Voucher Pay-checks (Figs. 15 *a* & *b*).

When the mine is so situated that payment for wages can be made by check, this practice is usually adopted.

San Antonio Mining Co. — **Contractors' Pay-roll**

Contract No	Location	Class of Work	Advance Feet	Units	Rate
1456	Block 79	Stoping		79 cars	.50
		"		196 "	.75
		"		137 "	1 —
"	Raise 795	Development	29		4 —

No E	Name	Occupation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	R. Grant	Driller	8	8	8	8	4	8	8	8	8	—	8	8	6	8	8
2	G. Rodriquez	"	8	8	—	8	8	8	8	8	8	—	—	4	8	8	8
3	A. Antonini	"	4	8	6	8	8	8	8	8	8	—	—	8	8	8	8
4	Jose Lora	"	8	8	8	8	8	8	8	8	8	—	8	8	8	8	8
5	P. Castillo	"	8	—	8	8	8	8	8	8	8	—	—	8	8	8	8
6	F. Zelaya	Shoveler	8	8	8	8	—	8	8	8	8	—	—	—	10	8	8
7																	
8																	
9																	
10																	
11																	
12																	
13																	
14																	
15																	
16																	
17																	
18																	
19																	
20																	
	A. B. Price	Contractor	8	10	8	6	8	8	9	8	8	—	7	8	8	8	8

Fig. 14a.—Contractors' Pay-roll.

Period March 1-15, 192– Contractor *A. B. Price*

Total Amt		Held		Pay		Dist'n No	Remarks
39	50			39	50	6	
143	—			143	—	2	
137	—			137	—	1	
110	—	10	—	100	—	1	110 held until ruins is started out to 5 & 5 at +25
429	50	10	—	419	50		

Time		Rate		Total Amt		Store		Warehouse		Hospital		Hotel		Other Deductions Acct.		Amt.		Total Deduct		Balance Due		Remarks
13	4	3	50	47	95	15	10			15								15	10	32	85	
11	2	3	—	34	50	24	50			25								24	50	9	50	
12	2	3	—	36	75	17	—			25								17	50	19	25	
14		3	—	42	—	9	75			30								9	75	32	25	
12	—	3	—	36	—	13	—		50	35								13	50	22	50	
11	2	2	—	22	50	2	—			20								2	00	20	50	
				219	—																	
14	—			210	50	9	—	117	—	90		22	50					139	50	51	00	
																						A. B. Price

FIG. 14b.—Contractors' Pay-roll.

Check No.53359 Employee's No.138

MARY MINING COMPANY
Pay-roll Check

Bearcat, N.M., Feb. 23, 192—

Pay to the order of Thos. Wilson $9.20

Nine dollars twenty cents

To the First National Bank,
Bearcat, New Mexico.

Mary Mining Company,
by_____
Cashier

Received from Mary Mining Company the amount due me as stated within:

Make all indorsements here:

Payee

FIG. 15a.—Voucher Pay-check (face).

Name — Thos. Wilson

Employee's No. 138

For month of February, 192–

Occupation	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		Total Hours	Rate	Amount
Laborer	8	8	8	8	8												40	30	12.00
Straw Boss							8	8	8	8	8	8		8	8		64	40	25.60
																			37.60

Deductions: Store $23.00 Warehouse Hospital 0.40
Hotel House rent 5.00 Other deductions Total 28.40

Net balance due 9.20

Fig. 156.—Voucher Pay-check (reverse).

The daily time worked is posted to these checks from the Office Time Book, instead of to the pay-rolls; the workman then has a complete statement of his time worked and the company's record is the Office Time Book, which is all that is necessary. When this form of check is used, the pay-roll form does not show the daily time, but has columns for gross earnings as taken from the voucher check, together with the deductions and balances columns as on the form of pay-roll used for cash settlements. After the voucher pay-checks have been cashed, they are cancelled and returned by the bank to the company's office and are either placed on file with the corresponding pay-rolls, or forwarded to the head office.

CHAPTER SIX

GENERAL OFFICE RECORDS OF SUPPLIES

Essential Records:	Subsidiary Records:
Purchase Orders	Local Purchases
Register of Supplies Ordered	Supplies on Hand & on Order
Cost Book	

Purchase Orders (Fig. 16).

Orders for new warehouse stock should be given on special numbered forms, made out in triplicate. The original is sent forward to the purchasee, one copy is kept at the general office, and one copy is sent to the warehouse clerk. The office copy is filed with the other unfilled purchase orders; the Acknowledgement of Order stub,[1] as detached and filled in by the purchasee, is attached to the corresponding Purchase Order when received. When the warehouse clerk advises the general office that the shipment has been received and accepted, the amount of the invoice is credited to the purchasee in the Invoice Record; the purchase order is then taken from the "Unfilled Orders" file and placed on permanent record in its numerical order in the "Filled Orders" file.

The rule should be enforced that supplies must always be ordered upon the standard order form; the practice of placing verbal orders is to be avoided. The writer well remembers an unhappy period in his early experience, when his verbal order for 2000 running feet of mine rails resulted in the arrival at the mine of 2000 rails, each 20 feet long! Specifications for supplies should be made as explicit as possible, so that no question may arise as to the brand or quality of material required. A form upon which materials may be asked for by heads of departments should be in use, and all requests

[1] Ref. "The Efficient Purchase and Utilization of Mine Supplies" by Stronck and Billyard; John Wiley and Sons.

Purchase Order No. 563 MARY MINING CO.,
Bearcat, N. M., August 15, 192–

Ordered from Harron, Rickard & McCone, 225 So. San Pedro St., Los Angeles, Cal.

Gentlemen: Please ship by freight to Bearcat, New Mexico, the following materials:.

Quantity	Articles
6 Doz.	Round point, D handle, Red Edge shovels No. 3

Terms.—2% ten days

NOTE: *Our Purchase Order Number* must appear on your invoice; otherwise, invoice will be returned for correction. Invoice in *duplicate* and bill-of-lading with weights and freight rates must be sent promptly on shipment of goods.

MARY MINING CO.

per.....
Purchasing Agent.

.....

Acknowledgment of Order MARY MINING CO.
Bearcat, N. M., Aug. 15, 192–

Purchase Order No. 563
Please fill in this slip and return immediately:
Shipment date.....192
From..... Purchasee.....

FIG. 16.—Purchase Order.

for new stock should be required in writing. More care will be taken in the ordering of supplies if this rule is observed.

Local Purchases.

While materials and supplies will be purchased whenever possible in quantity from jobbers or manufacturers, in order to obtain the lowest market prices, it often happens that purchases must be made locally to meet an emergency. A Local Purchase form should be used for this purpose; all such purchase orders should be made out in duplicate, the copy being placed on file at the general office. Local merchants should be notified that goods can only be charged to the company's account when the order is given upon the Local Purchase form, properly made out and signed by an authorized person.

Supplies on Hand and on Order (Fig. 17).

The object of this record is to show the quantities of the more essential supplies in stock at the warehouse and on order. When the mine is located within easy reach of the sources of supply, so that materials can be obtained within a short time when needed, this record may not be considered

OIL
Heavy Black

Previous year, used per month, 77

HEAVY BLACK OIL

192–

Unit — gallon

Date	On hand 1st of month	Used during month	Received	Order No.	On Order	Remarks
1/1	287	72				Inventory
2/1	215	69				
2/5				187	300	
3/1	146	76				
3/16			300	187		
4/1	370					

FIG. 17.—Supplies on Hand and on Order Index.

necessary, as the control of stock on hand may be intrusted to the warehouse department. However, when the arrival of supplies is a question of several weeks or months after the order has been sent out, a close supervision by the management of the stock of essential supplies on hand and on order becomes a matter of primary importance, as the exhaustion of the stock of any item may be the cause of serious inconvenience and loss. A card index is perhaps the most convenient form for this record, a separate card being used for each kind of material or article. The consumption of each item for the previous month, the quantities received during the month and the stock on hand are posted from a report submitted at the end of the month by the warehouse clerk. When a Purchase Order for supplies is made out, the date, order number and quantity of each article ordered are posted upon the Supplies on Hand and on Order index. Only the principal articles of warehouse stock are entered upon this record; minor articles are reported by the warehouse clerk when his stock card for any item shows that the supply on hand has become less than the minimum allowed. In the example given in Fig. 17, the inventory taken at the first of the year showed a stock of 287 gallons black oil; during January, 72 gallons were issued, leaving 215 gallons on hand Feb. 1st. On Feb. 5th, 300 gallons were ordered by Purchase Order No. 187, etc.

Register of Supplies Ordered (Fig. 18).

When the Purchase Order is made out, each item is listed upon the Register of Supplies Ordered; the subsequent details concerning the shipment are entered as they are received, to furnish a complete record of the order as filled and to determine the cost of each item as delivered at the warehouse. The average of the cost per unit of the new material with that already in stock is entered to the Cost Book, together with the purchase order number; in this way, the Cost Book serves as an index to the Register of Supplies Ordered, as the numbers of all purchase orders upon which any article appears are listed under that article in the Cost Book.

Ordered No.	Ordered Date	Quantity Ordered	Article	Date Rec'd	Bought from
559	8/12	1 set	Gears for hoist No. H3	9/7	Lidgerwood Mfg. Co.
560	8/12	1000 lbs.	Borax glass	8/27	Chas. Cooper & Co.
561	8/14	1000 "	Soda ash	8/24	McKesson, Robbins Co.
562	8/14	2 bbls.	Albany grease	8/26	Adam Cook's Sons

Continued from above

Quantity Received	Parcels	Invoice Cost	R. R. Frt.	Local Haul	Misc.	Total Cost	Remarks
1	1 crate	72.50	3.50	2.30	0.55	78.85	
1000 lbs.	10 boxes	220.00	9.35	5.80		235.15	20 Mule Powdered
1066 "	4 bbls.	48.40	9.50	6.00	1.20	65.10	
1510 "	2 "	112.20	11.40	7.90		132.20	

FIG. 18.—Register of Supplies Ordered.

	Ordered		Quantity	Articles	Wanted for	Purchasing Agent		Bought from
	Date	Req. No.				Date	Order No.	
	8/17	177	10,000lbs	Calcium Carbide 1¼" x ⅜"	Stock	9/10	21778	Union Carbide Co.

Continued from above

Shipping Port	Date Shipped	Description of Parcels				Delivery Dates				U.S. Currency							
		Dimensions	Marks	Parcel No.	Weights	Seaport	R.R. Stn.	Destination Point	Destination Date	Invoice Cost		U.S. Freight & Handling		Ocean Freight etc.		Purchasing Commission	
N.Y.	10/2	100 drums			10,700	10/20	10/27	San Fco Mine	10/30	500	00	14	20	140	20	16	35

Continued from above

Native Currency								Rate of Exchange	U.S. Cy. Equivalent of Native Charges		U.S. Cy. Total Cost		Unit	U.S. Cy. Cost per Unit		Remarks
Import Charges		R.R. Freight & Handling		Local Carting		Total										
122	00	582	40	21	00	725	40	420	172	71	843	46	lb.	0	084	S/S Saramaca

FIG. 19.—Register of Supplies Ordered.

Fig. 19 shows a form of Register for handling supply orders in a foreign country, where shipment is made by steamer. The invoices and bills-of-lading for each shipment received are filed under the name of the steamer and the date of arrival in port. These papers may be filed conveniently in a heavy envelope, upon which the essential information concerning the shipment is noted.

Article	Unit	Cost per unit								
Dynamite	lb.	0.24¹	0.24¹	0.24¹	0.26¹					
Gelatin 40%		103	137	156	174	198				
Dynamite.	lb.									
Gelatin 50%		198								

already on hand, and the average cost per unit for the entire lot is entered to the Cost Book, to be used in charging out the material as issued from the warehouse. For example:

1200 lb. wire nails costing $86.40 is received at the warehouse, and 920 lb., costing $0.068 per pound, is already on hand. Then the average unit cost for the entire stock of 2120 lb. wire nails is

$$\frac{86.40 + (920 \times 0.068)}{2120} \text{ or } \$0.070 \text{ per pound for the lot.}$$

This amount is entered upon the Cost Book as the unit cost price of all wire nails on hand.

When the Purchase Order is made out, its number is entered in the Cost Book under the name of each article included in the order; the unit cost of the stock on hand after the shipment has been received is filled in as soon as the charges upon the shipment are complete. The Cost Book is an index to the Register of Supplies Ordered, showing the purchase order numbers of all previous orders of any article. In the examples given in Fig. 20, former warehouse prices for 40 percent Gelatin dynamite were 24.6 and 24.7 cents per pound, the present stock being issued at 26.2 cents. Purchase Order No. 198 includes an order for 40 percent Gelatin which has not yet been received.

CHAPTER SEVEN

WAREHOUSE RECORDS

Essential Records:	Subsidiary Records
Stock on Hand Index	Way-bills:
Warehouse Requisitions,	Requisitions for Bills-of-material
Supplies Distribution,	Materials Returned
	Inventories

Way-bills (Fig. 21).

Where the mine is located at a distance from the railroad, a representative must be arranged for at the railroad station

Virginia M. & M. Co. Way-bill No. 2748

The following freight has been delivered to ..... Date May 26, 192–

..... Forwarding Agt.

No	Description	Contents	Gross wt.	Deliver at
6	Kegs	Nails	652	Mine warehouse
5	Bbls.	Oil	1820	Mine warehouse
1	Bbl.	Oil (leaking)	340	Mine warehouse
12	Cases	Dynamite	846	Magazine
			3658	

Received ..... Delivered .....

Freighter Warehouse Clerk

Fig. 21.— Way-bill.

to receive freight and to forward it to the mine. If ore shipments are made, he arranges for cars and attends to the loading and shipping of the ore to the smelter. At small stations, the railroad agent is usually employed to look after

the company's shipping. This representative, or forwarding agent as he is called, advises the general office by mail or telephone concerning the contents of each shipment of supplies as received at the station. He supervises the loading of freight for transportation to the mine and furnishes each freighter with a way-bill for the contents of his load. The way-bill states the number of pieces, as barrels, boxes, sacks, etc. which each freighter has received, together with the contents, gross weight and destination of each item. The way-bills are numbered and are made out in triplicate; the original is given to the freighter, one copy is mailed to the mine office, and the other copy is held by the agent. All three copies are signed by the freightor upon receiving his load. When the freight is delivered at the warehouse, the clerk checks the way bill with the load as received and files it. The freighter is issued an order upon the cashier for the amount due, if the hauling is done by contract. The warehouse clerk should be provided with forms for notifying the general office of all supplies received.

Stock on Hand Index (Fig. 22).

The object of this record is to show at all times the stock of supplies and materials on hand at the warehouse for which it is kept. A card index is usually used for this purpose; a separate card is kept for each size and variety of every kind of material or article in stock. Warehouse issues are posted directly to the Stock Cards from the Warehouse Requisitions. With items of stock which are constantly being issued in small quantities, as nails, waste, etc., the necessity of making many entries upon the stock cards can be avoided by charging out such articles upon the cards to a reserve stock in sufficient quantity to last for several days at the normal rate of consumption. New stock is entered upon the cards when received at the warehouse. On the example of Stock Card shown in Fig. 22, the symbol + is used to denote new stock received and − to denote stock issued; the warehouse inventory taken on Jan 1st showed 167 lb. 4″ wire nails in stock; on Jan. 2nd. 8 lb. was issued, leaving 159 lb. on hand; on

the 3rd, 300 lb. of new stock was received, making a total stock on hand of 459 lb., etc. The unit cost is entered to the card from the Cost Book in pencil, so that the amount can be changed with each new shipment received. When the stock on hand falls below the minimum allowed, the clerk should notify the general office. Orders for warehouse stock should be made out or checked by some one who is familiar with the current needs, so that materials no longer used will be recognized and those for which the rate of consumption has changed may be ordered in quantities to meet present conditions.

Nails, 4" Wire

Minimum Stock 100 lbs.

4" Wire Nails

Location in Warehouse G.19

Unit—Lb. Unit Cost $0.020

192-

Inv.														
1/1	167													
—	8													
1/2	159													
+	300													
1/3	459													
—	6													
1/3	453													

FIG. 22.—Stock on Hand Index.

The warehouse clerk should be required to inventory parts of his stock from time to time, to see that the warehouse system is running smoothly and that his cards agree with the actual stock on hand. Only small discrepancies should occur and these are corrected upon the cards as they appear, the general office being notified regarding shortages so that they may be charged out at the end of the month to the current operations. These charges for shortages in the warehouse stock may be distributed to the various accounts in the pro-

portion of the monthly distribution of the supplies issued.

Stock Books (Fig. 23).

At points where materials are kept on hand but no clerk is employed, as at small outside prospects, etc., a card index will not be needed for keeping account of the supplies. The record will usually be kept by persons of little or no clerical ability, and a strong book, ruled off to suit the requirements, will be found more satisfactory. Fig. 23 shows a form of Stock Book of this kind. The book is kept in a similar manner to the stock cards, a full page or a part of a page being given to each item. Only important supplies should be

Article	Unit	Date 192–	Received	Issued	On Hand	Issued for what purpose
Blasting Caps, 5X	*each*	*2/4*	*800*		*800*	
		2/5		*100*	*700*	*To Simpson, contractor*
		2/6		*10*	*690*	*Development*
		2/8		*25*	*665*	"

Fig. 23.—Stock Book.

carried in stock at such places, small items being charged out to the work at once whenever possible. The reports at the end of the month from these places should include an inventory of the actual stock on hand, so that the issues and receipts can be checked by the difference of the stock from month to month. As a rule, such records are kept in a more or less haphazard manner; they are usually subject to many errors and these must be hunted down at the office.

Warehouse Requisitions (Fig. 24).

The issuing of materials and supplies from the general storehouse to the numerous ramifications of the work is one of the most potent sources of loss in the direction of mining operations. Workmen, as a class, are notoriously wasteful of company stores, and it is only by keeping a vigilant watch

over the delivery of supplies that extravagance and waste, as well as dishonesty, can be prevented. The simple knowledge that a close check is being kept upon the materials issued will do much to promote economical methods. Supplies should be issued from the warehouse only upon the presentation of an order, made out and signed by a foreman or some other authorized person. However, care in the issuing of supplies does not imply needless formality or waste

Date April 9, 192–

Warehouse Clerk: Please deliver the following:

Article	Quantity	Amt.		Intended for what purpose	Group No.
¾" galv. pipe	40 ft.			Dwelling #34	17
¾" elbows	3			Dwelling #34	17
¾ tee	1			Dwelling #34	17

Note: Use for supplies to one subaccount only.

Account No. 612

.....
Foreman

Fig. 24.—Warehouse Requisition.

of workmen's time; the material called for should be dispatched from the warehouse with as little delay as possible when the requisition is delivered. These Warehouse Requisitions constitute the clerk's receipts for supplies issued; they should show a clear statement of the use to be made of the materials ordered. By using separate requisitions for materials to each subaccount, they can be segregated for convenient reference. At the end of the month, they should be filed together in a binder, tab indexed to show the requisitions to each subaccount.

Foremen and workmen should be encouraged to practice rigid economy in the use of supplies; they should be made to feel that the consumption of warehouse stock is under the critical eye of the management, and that judgement and care in the use of supplies will be recognized and rewarded. If left to itself, a requisition system will invariably degenerate into a mere formality. The foreman is usually occupied with numerous duties and unless he makes a special effort to find out the purpose for which supplies are intended and sees that they are used for that purpose the workmen soon learn that to obtain all the material wanted is only a matter of asking for the requisition.

Requisitions for Bills-of-Material.

Bills-of-Material or Job Requisitions should be employed whenever they can be used. With this method, the quantities of materials needed for any job are determined as exactly as possible, usually by the engineering department, and a bill-of-material for the job is sent to the warehouse. The materials called for upon this statement are then subject to delivery to any responsible person, upon his giving a receipt. Spoiled material must be returned to the warehouse to be replaced, and material in excess of the amount stated upon the bill-of-material will not be issued without an explanation from the foreman and authorization from the office for the issue of the additional material required. No loss of time should be incurred by the application of this rule, as the foreman should be required to keep account of the condition of his allowance of materials and to give notice that an additional supply will be required before the deficiency occurs.

Materials Returned.

Materials are sometimes issued and not used, or they may be used for a time and then returned in good condition to the warehouse. A Materials Returned slip, preferably on colored paper, should be used to give credit to the proper accounts for supplies and materials returned to the warehouse.

Credits entries for these items are made upon the Supplies Distribution and upon the General Distribution in red ink.

Supplies Distribution (Fig. 25).

The object of this record is to make the final distribution of the daily issues of materials and supplies from the warehouse to the accounts benefitted. It also furnishes a permanent record of the materials used on each job or operation. The classification of supplies to be used with this record will vary with conditions; the following classification is given in the example shown in Fig. 25:

Group No.	Group
1	Bolts, nuts, washers, etc.
2	Brick, cement, etc.
3	Locomotive, car and truck parts
4	Carbide and candles
5	Chemicals
6	Drill parts
7	Drill steel
8	Explosives
9	Electrical supplies
10	Fuel
11	Iron & steel
12	Lumber and mine timber
13	Miscellaneous
14	Nails, screws, etc.
15	Oils, grease, etc.
16	Packing, waste, etc.
17	Pipe & fittings
18	Tools
19	Track & supplies

A separate Supplies Distribution sheet is carried for each active account; these sheets are posted daily from the Warehouse Requisitions. From the Supplies Distribution, the total warehouse charge for the month to each account is posted to the General Distribution sheet, which is carried at the general office. After the records have been closed at the end of the month, the Supplies Distribution sheets should be filed under the headings of the accounts, rather than by months, so that the costs of supplies and materials used on any job can be found without loss of time.

SUPPLIES DISTRIBUTION — Month of September, 192—

Account ÷ Drills & Compressors

No.	Group	1	2	3	4	5	6	7	8	9	10	29	30	31	Adjustments	Total
1	*Bolts, Nuts, Washers, etc.*		0 67													
2	*Brick, Cement, etc.*															
3	*Loco., Car & Truck Parts*															
4	*Carbide & Candles*															
5	*Chemicals*															
6	*Drill Parts, etc.*	9 70		16 40												
7	*Drill Steel*															
8	*Explosives*															
9	*Electrical Supplies*															
10	*Fuel*															
11	*Iron & Steel*	2 00														
12	*Lumber & Timber*															
13	*Miscellaneous*															
14	*Nails, Screws, etc.*															
15	*Oils, Grease, etc.*	2 90	3 20	3 00												
16	*Packing, Waste, etc.*			4 25												
17	*Pipe & Fittings*															
18	*Tools*															
19	*Track & Supplies*															
	Totals															

FIG. 25.—Supplies Distribution.

Inventories.—An inventory of all warehouse stock should be taken at regular intervals, usually twice yearly. Losses from handling, leakage, etc. are unavoidable, and to prevent any considerable difference between the book cost and the actual inventory value of stock on hand, a small percentage above cost may be allowed in charging out warehouse supplies; this should not exceed five percent and will usually be less. The percentage to be allowed may be changed from time to time, in order to make the inventory value of the warehouse stock check out as closely as possible at the end of the period with the book cost. This method of an adjustable "selling" price has the disadvantage that the amount of actual shortage cannot easily be determined. By charging out the warehouse issues at cost, or at a fixed percentage above cost, a definite check on the warehouse issues can be obtained. Any difference at the end of the period between the inventory value and the book cost should be charged off to Profit and Loss, or it may be charged out at once or during the next period in the proportion of the material charges to the various accounts. If a "selling" percentage is added, it should be changed after each inventory to maintain the balance as closely as possible. The principal items of supplies, as explosives, carbide, etc., should be inventoried at the end of each month and any shortages corrected by charging them out to the current accounts for the month.

CHAPTER EIGHT

Monthly Statements.

The final analysis of expenditures and income is given by the Monthly Statements, which are compiled from the general office records after the books have been balanced at the end of the month. These statements constitute the financial report to the head office, covering the operations during the month; they should afford a clear basis for comparison of the work done and the results accomplished, by which a definite conclusion can be reached concerning the efficiency and economy of the operations. The following statements will be considered as comprising a specimen monthly report to the head office; these will be supplemented in practice by such additional information as may be desired:

COST STATEMENT
COMPARATIVE COSTS FOR YEAR-TO-DATE
MINING & METALLURGICAL STATEMENT
RECEIPTS & DISBURSEMENTS
OUTSTANDING CHECKS
ACCOUNTS PAYABLE & ACCOUNTS RECEIVABLE
TRIAL BALANCE

Monthly Cost Statement (Figs. 26 *a* to *d*).

This statement is made up from the total distributed charges for the month as taken from the General Distribution record. Working costs are based upon the cost per dry ton mined or per dry ton treated at the reduction plant, and also upon the cost per unit involved in any particular class of work, as per foot of development work, per ton of ore stoped, etc. In the example shown in Figs. 26 *a* to *d*, an average working cost per foot for Dead Work has not been extended, as this account often includes charges for work not measured in terms of lineal feet, as shaft stations, etc. The cost figures

Ore milled, tons 4100
Ore stoped, tons 3240
Dead work, feet 428 0
Development, feet 812 8

San Antonio Mining Co.

Month of June, 192-

Dead work	No.	Labor	Supplies	Sundries	Power	Total	Per ton milled	
Breaking ground	01	827.40	628.10			1455.50	0.355	
Timbering	02	39.34	103.18			142.52	0.035	
Pumping	03							
Tramming	*A*	263.18	7.45			270.63	0.066	
Hoisting	*B*	32.70	3.77		15.75	52.22	0.012	
Drills & compressors	*C*	22.45	29.93		31.97	84.35	0.021	
Tool sharpening	*D*	28.70	28.16			56.86	0.014	
Total		1213.77	800.59		47.72	2062.08	0.503	

Development								Per foot
Breaking ground	11	1013.26	671.00			1684.26	0.411	2.072
Timbering	12	42.02	145.34			187.36	0.046	0.230
Pumping	13							
Tramming	*A*	270.34	13.50			283.84	0.069	0.349
Hoisting	*B*	60.47	6.97		29.09	96.53	0.024	0.119
Drills & compressors	*C*	49.55	56.60		64.90	171.05	0.042	0.211
Tool sharpening	*D*	33.20	32.60			65.80	0.016	0.081
Total		1468.84	926.01		93.99	2488.84	0.607	3.062

Stoping								Per ton stoped
Breaking ground	21	1728.28	775.73			2504.01	0.611	0.773
Timbering	22	135.80	179.20			315.00	0.077	0.097
Tramming	*A*	655.86	39.70			695.56	0.170	0.215
Hoisting	*B*	202.45	23.35		97.06	322.86	0.079	0.100
Drills & compressors	*C*	64.88	86.53		92.33	243.74	0.059	0.075
Tool sharpening	*D*	49.36	48.37			97.73	0.024	0.030
Total		2836.63	1152.88		189.39	4178.90	1.019	1.290

Mine general								
Supervision	31	356.93	17.06			473.99	0.116	
Mtce. timbering	32	42.70	38.56			81.26	0.020	
Mtce. pumping & draining	33	35.60	10.02			45.62	0.011	
Track & supplies	34		162.52			162.52	0.040	
Steel	35		107.68			107.68	0.026	
Mine miscellaneous	36							
Total		535.23	335.84			871.07	0.213	

Remarks:

Accountant

Supt.

FIG. 26a.—Monthly Cost Statement.

Ore milled, tons.....4100
Ore cyanided, tons.....4183

SAN ANTONIO MINING CO.
Month of June, 192–

Ore treatment	No.	Labor	Supplies	Sundries	Power	Total	Per ton milled	
Milling								
Supervision	41	125.00				125.00	0.030	
Crushing	42	53.34	7.15		94.60	155.09	0.038	
* Conveying & sorting	43	303.58	33.22		9.46	346.26	0.084	
Stamping	44	330.74	1430.94		378.40	2140.08	0.522	
Amalgamation	45	243.96	44.54			288.50	0.070	
General maintenance	46	70.14	146.78			216.92	0.053	
Miscellaneous	47							
Total		1126.76	1662.63		482.46	3271.85	0.797	

* Sorted out 916 tons waste.

Cyaniding								Per ton treated
Supervision	451	125.00				125.00	0.030	0.029
Classification	452	13.34	0.98		47.30	61.62	0.015	0.015
Concentrates treatment	453	45.00	286.86		47.30	379.16	0.092	0.091
Sands treatment	454	78.36	640.22		94.60	813.18	0.198	0.194
Slimes treatment	455	94.42	693.52		359.50	1147.44	0.280	0.274
Precipitation	456	7.00	419.80			426.80	0.104	0.102
Cleanup & smelting	457	6.48	126.92			133.40	0.033	0.032
General maintenance	458	20.58	3.52			24.10	0.006	0.006
Miscellaneous	459		1.96			1.96	0.000	0.000
Total		390.18	2173.78		548.70	3112.66	0.758	0.744
Total ore treatment		1516.94	3836.41		1031.16	6384.51	1.556	
Marketing bullion								
Transportation	51	7.50		245.20		252.70	0.061	
Insurance	52			153.00		153.00	0.037	
Assay charges	53			97.60		97.60	0.024	
Total		7.50		495.80		503.30	0.122	

Remarks:

Accountant

Supt.

FIG. 26*b*.—Monthly Cost Statement.

Ore milled, tons ..... 4100 — San Antonio Mining Co. Month of June, 192-

General expense	No	Labor	Supplies	Sundries	Power	Total	Per ton milled
General office	61	1025 14	41 09			1066 23	0 260
Surveying	62	175 49	9 75			185 24	0 045
Assaying & sampling	63	155 70	143 14		9 46	308 30	0 076
Hospital	64	77 90	5 46	57 60 (Cr.)		25 76	0 006
Legal	65	75 69				75 69	0 018
Taxes	66			420 00		420 00	0 102
Insurance	67						
Boarding house	68	32 52	154 18	160 20 (Cr.)		26 50	0 006
Policing	69	76 60	1 62			78 22	0 019
Stable	610	52 06	63 72			115 78	0 028
Building maintenance	611	17 44	69 76	54 90 (Cr.)		32 30	0 008
Water supply	612	12 86	17 60			30 46	0 007
Lighting	613		3 40		141 90	145 30	0 035
Telephones	614	25 10	14 50			39 60	0 010
Roads	615	14 80	10 34			25 14	0 006
Tools account	616		103 20			103 20	0 025
Shop expense	617	18 08	7 40		18 92	44 40	0 011
General miscellaneous	618	61 35	0 40		26 57	88 32	0 022
Total		1820 04	645 50	147 30	196 85	2809 75	0 685
Live stock & vehicles	7		78 40			78 40	0 019
Furniture & fixtures	8		42 15			42 15	0 010
Constructions & improvements	9						
Bunkhouse #3 Superstructure	945	190 40	489 30	14 60		694 30	0 169
Total		190 40	489 30	14 60		694 30	0 169

Remarks

Accountant

Supt.

FIG. 26c.—Monthly Cost Statement.

Ore milled, month..... 4100
Ore milled, year to date..... 24200

SAN ANTONIO MINING CO.
Month of June, 192-

Summary	Labor	Supplies	Sundries	Power	Total	Per ton milled
Operating expense						
Dead work	1213.77	800.59		47.72	2062.08	0.503
Development	1468.84	926.01		93.99	2488.84	0.607
Stoping	2836.63	1152.88		189.39	4178.90	1.019
Mine general	535.23	335.84			871.07	0.213
Ore treatment	1516.94	3836.41		1031.16	6384.51	1.556
Marketing bullion	7.50		495.80		503.30	0.122
General expense	1820.04	645.56	173.87	170.28	2809.75	0.685
Total operating expense	9398.95	7697.29	669.67	1532.54	19298.45	4.706
Capital charges						
Live stock & vehicles		78.40			78.40	0.019
Furniture & fixtures		42.15			42.15	0.010
Constructions & improvements	190.40	489.30	14.60		694.30	0.169
Total capital charges	190.40	609.85	14.60		814.85	0.198
Grand total	9589.35	8307.14	684.27	1532.54	20113.30	4.904

Financial statement	Month		Year to date	
	Total	Per ton	Total	Per ton
Operating revenue				
Bullion production per mine assays	43337.50	10.85	248350.90	10.24
Adjustment for liquidations received			842.30	0.04
Operating expense	19428.15	4.74	119140.70	4.91
Operating revenue	23909.35	6.11	130052.50	5.37
Non-operating revenue				
Store profit for year to date			5420.00	0.22
Misc. income & charges				
Interest on bank deposits			142.10	0.01
Non-operating revenue			5562.10	0.23
Total income	23909.35	6.11	135614.60	5.60
Disposition of income				
Capital charges	814.85	0.20	8392.12	0.35
Surplus	23094.50	5.91	127222.48	5.25

Remarks:

Accountant

Supt.

FIG. 26*d*.—Monthly Cost Statement.

used are based upon results from operations in Central America.

Comparative Costs for Year-to-date (Fig. 27).

All cost data appearing upon the monthly Cost Statement is posted to small tracings of the same size as is used for the Cost Statement forms (standard letter size), and copies of these are included in the Monthly Statements. These sheets furnish a comparsion of the monthly costs during the year, so that a variation from the normal costs for any item will be noticed at once. The foreman of each department is supplied with the sheets showing the results from the work under his charge, and he is encouraged to make a close study of his working costs. This plan will do much to stimulate interest in keeping down operating expenses; it gives every foreman an incentive to work for better results and to establish a creditable cost record for his department.

Mining & Metallurgical Statement (Figs. 28 *a* & *b*).

This statement shows the total advance made in the headings during the month, the number of tons of ore stoped, the total ore production, etc. It also outlines the ore treatment, with all information available for checking up the actual results realized, with the calculated results as indicated by the daily routine mill assays.

Receipts & Disbursements.

This statement is a summary of all cash transactions for the month, as taken from the Cash Journal.

Outstanding Checks.

The bank will render a monthly statement to the company, showing deposits received, checks cashed and balance on deposit. The checks cashed during the month are cancelled and returned to the company with the statement; these are checked off in the Cash Journal with the checks sent out, and a list is made of Outstanding Checks. The sum of the Cash Journal bank account balance and the total amount of the checks outstanding must give the balance of the bank statement for the same period.

DEVELOPMENT		Average Previous Year		Jan.		Feb.		Dec.		Average Current Year	
Breaking Ground	*Labor*										
	Supplies										
	Sundries										
	Power										
	Total										
	Per Foot										
Tramming	*Labor*										
	Supplies										
	Sundries										
	Power										
	Total										
	Per Foot										

FIG. 27.—Comparative Costs for Year-to-date.

Ton = 2000 lb.
Au, $20.67 per oz.
Ag, $1.00 per oz.

San Antonio Mining Co.
Mining & Metallurgical Statement
Month of June, 192

Advance in feet	Month			Year to date		
	Dead work	Development	Total	Dead work	Development	Total
General mine	208.0	812.8	1020.8	963.0	3970.6	4933.6
Drainage tunnel	220.0		220.0	792.0		792.0
Total	428.0	812.8	1240.8	1755.0	3970.6	5725.6

Ore production	Dry tons
Ore milled	4100
Less broken ore on hand June 1st	1430
Difference	2670
Broken ore on hand July 1st	1590
Total ore production during month	4260
Less ore from development	1020
Ore stoped during month	3240

Stamping record	Month				Year to date			
	Running time		Dry tons crushed		Running time		Dry tons crushed	
	Full days	%	Total	Rate per full day	Full days	%	Total	Rate per full day
	28.5	95.0	4100	143.9	170.7	94.3	24200	142.1

Amalgamation	Au	Ag	Total	Total assay value, month	Bullion recovered, month	Total assay value, year to date	Bullion recovered, year to date
Mill heads	$9.47	$2.26	$11.73	48093.00		278432.00	
Plate tails	4.52	2.01	6.53	26773.00		156669.00	
Indicated recovery	4.95	0.25	5.20	21320.00	20167.50	119762.40	116476.90
% indicated extraction	52.3	11.1		44.3	41.9	43.3	42.1

Cyanide plant, tonnage statement	Concentrates	Sands	Slimes	Total
On hand, June 1st	3.85	515	390	909
Received during month	26.28	2204	1870	4100
Total	30.13	2719	2260	5009
Less on hand, July 1st	3.04	463	360	826
Tonnage treated during month	27.09	2256	1900	4183
Tonnage previously treated	151.17	10426	9563	20140
Total tonnage treated, year to date	178.26	12682	11463	24323

Remarks:

Supt.

FIG. 28a.—Mining and Metallurgical Statement.

Ton = 2000 lb.
Au, $20.67 per oz.
Ag, $1.00 per oz.
Ore milled, month, 4100, year to date 24260

SAN ANTONIO MINING CO.
Mining & Metallurgical Statement
Month of June, 192–

Cyaniding	Au	Ag	Total	Total assay value, month	Total assay value, year to date
Concentrates, tons 27.09					
Heads	$30.76	$12.36	$43.12	1168.12	7486.92
Tails	1.21	2.09	3.30	89.40	552.60
Recovered by assay	29.55	10.27	39.82	1078.72	6934.32
% recovered by assay	96.1	83.1		92.3	92.6
Sands, tons 2256					
Heads	4.67	1.81	6.48	14618.88	80530.70
Tails	0.39	0.69	1.08	2436.48	12935.64
Recovered by assay	4.28	1.12	5.40	12182.40	67595.06
% recovered by assay	91.6	61.9		83.3	83.9
Slimes, tons 1900					
Heads	4.46	1.53	5.99	11381.00	68778.00
Tails	0.29	0.56	0.85	1615.00	9514.29
Recovered by assay	4.17	0.97	5.14	9766.00	59263.71
% recovered by assay	93.5	63.4		85.8	86.2

	Month		Year to date	
Cyaniding summary	Dollars per ton treated	Total value	Dollars per ton treated	Total value
Heads	6.49	27168.00	6.45	156795.62
Tails	0.99	4140.88	0.95	23002.53
Recovered by assay	5.50	23027.12	5.50	133793.09
% recovered by assay		84.8		85.3
Bullion recovered	5.54	23170.00	5.42	131874.00
% bullion recovered		85.3		84.1

Production summary on basis of ore milled	Dollars per ton ore milled	Total value	Dollars per ton ore milled	Total value
Mill heads	11.73	48093.00	11.39	276432.00
Production: mill bullion	5.20	20167.50	4.80	116476.90
Production: cyanide plant bullion	5.65	23170.00	5.44	131874.00
total production	10.85	43337.50	10.24	248350.90
Total recovery by mill tonnage		90.1%		89.0%

Remarks:

Supt.

FIG. 28*b*.—Mining and Metallurgical Statement.

Accounts Payable & Accounts Receivable.

This statement shows a list of all accounts owed by, and owing to, the company when the books were closed at the end of the month.

Trial Balance.

The Trial Balance is a list of all active accounts as taken from the General Ledger, with the total debit or credit to each account. The balancing of the total debits with the total credits proves that the final accounts are correct.

CHAPTER NINE

RECORDS AND REPORTS OF DAILY OPERATIONS

Summary of Daily Operations: (Fig. 29 *a* & *b*).[1]

This record presents a general summary of the daily reports from the various departments. It should give a complete resume' of the results obtained from general operations and will be found very useful to the superintendent as a wall sheet for constant reference. From it, a clear outline of the progress of the work from day to day is at hand; any irregularities, as a high labor cost, variation in production, etc, can be noted immediately and these differences should be explained by reference to the corresponding report of the department in question. The superintendent is able to determine where the work is running as it should and can devote his attention to the places where it is most needed. An example of a Summary of Daily Operations record is shown in Fig. 29 *a* & *b*; this outline will be enlarged upon in practice to cover all variable factors which may require attention.

Daily Reports.

Brief daily reports, covering the more important details concerning the work and the results obtained, should be required from the foremen of the various departments. All changes, delays, difficulties encountered, etc., should be explained, regardless of verbal reports which may already have been made. These daily reports form an important link between the office and the actual operations; they furnish a means of definitely fixing responsibility and enable the superintendent to see at a glance when the work is running as it should. Moreover, they afford an opportunity for the foreman to air his own ideas, and to make recommendations

[1] "Principles of Mine Management" by Chas. A. Chase, *Engineering & Mining Journal*, Dec. 30, 1911.

concerning the work under his charge. The summary of these daily reports is posted to the Summary of Daily Operations in the superintendent's office.

The Daily Mine Report (Figs. 30) should cover those phases of the mine work which may require special attention: the number of each class of workmen employed, approximate grade of ore sent to the mill, etc. The reverse side of the sheet may be ruled for making a general report of conditions, under this caption:-

DAILY MINE REPORT. Approximate grade of ore sent to mill $.....	If sent forward in blank, mine foreman assumes the responsibility of reporting satisfactory conditions. If ore is below grade, state reasons. List supplies needed and purpose of same on separate sheet.

The daily report from the treatment plant covers the essential details of the process of ore treatment, with a statement of difficulties or needs and recommendations regarding the work. A comprehensive discussion of metallurgical records is beyond the aspirations of this volume and examples of records covering this phase of the work have been purposely omitted, as they could not be given in such form as to be of general application. A most important consideration with any method of ore treatment, and one which is frequently neglected, is the practice of keeping complete and intelligible records of all tests and experiments which may be made in connection with the work. All data of practical value should be recorded and filed for future reference, and copies of all such information should be forwarded to the head office.

The daily foremen's reports are made out from the timekeeper's records and from reports to each foreman from bosses and workmen. These latter reports furnish the ultimate details concerning the work, for the information of the foreman and for making up any additional data which may be desired at the general office. A few of these interdepartmental reports are given as examples; others can readily be worked out as their need becomes evident:

SUMMARY OF DAILY OPERATIONS

Date	Cars Trammed		Machine Shifts				Labor						
	Ore to Mill	Waste	Dead Work	Development	Stoping	Total	General	Surface	Underground	Mill	Cyanide Plant	Overtime	Total
1	*157*	*49*	*3*	*5*	*7*	*15*	*10*	*16*	*52*	*9*	*11*	*3*	*101*

Continued from above

Tons Milled	Amalgam ozs.		Mill Heads						Plate Tails					
	Daily	Month to Date	Assay			Content $			Assay			Content $		
			Au	Ag	Total	Au	Ag	Total	Au	Ag	Total	Au	Ag	Total
137.0	*183.2*		*9.24*	*2.30*	*11.54*	*1266*	*315*	*1581*	*3.60*	*2.16*	*5.76*	*493*	*296*	*789*

Continued from above

Month of June, 192–

Tons	Concentrates						Tons	Cyanide Solution					
	Assay			Content $				Assay			Content $		
	Au	Ag	Total	Au	Ag	Total		Au	Ag	Total	Au	Ag	Total
0.83	*26.87*	*14.91*	*41.78*	*22*	*13*	*35*	*612*	*0.92*	*0.34*	*1.26*	*563*	*208*	*771*

FIG. 29a.—Summary of Daily Operations.

SUMMARY OF DAILY OPERATIONS

CYANIDE PLANT—COMPLETED CHARGES *June, 192—*

	Charge No.	Tons	HEADS Assay $ Au	Ag	Total	HEADS Content $ Au	Ag	Total	TAILS Assay $ Au	Ag	Total	TAILS Content $ Au	Ag	Total	% Indicated Recovery Au	Ag	Total
CONCENTRATES	859	1.66	23.76	22.00	31.76	39	34	80	0.80	1.06	1.86	1	2	3	97.5	94.3	96.3
	867	201.6	3.30	1.79	5.09	501	978	773	0.30	0.63	0.93	60	95	141	96.2	91.8	91.7
SLIMES																	
	25.3	229.6	4.34	1.00	5.34	996	230	1226	0.68	0.36	0.98	142	83	225	85.7	61.0	81.6
SANDS																	

FIG. 296.—Summary of Daily Operations.

Powderman's Report (Fig. 31).

A daily report is made out by the powderman, showing the quantities of explosives issued. If a separate record is kept for each working face, the Powderman's Report shows the amount issued to each place. The report is submitted to the warehouse clerk, who is responsible for the distribution of the charges for explosives and for the accuracy of the

Daily Mine Report — Date—March 9, 192–

Cars trammed			Machine shifts		Labor employed			
Working face	Ore to mill	Waste	Working face	Shifts	Surface	Shifts	Underground	Shifts
Block 717	49		do	2	Bosses	1	Shift bosses	2
					Hoistmen	3	Machinemen	18
Block 722	42		do	2	Landers	3	Machinemen helpers	4
					Blacksmiths	2	Muckers	7
Block 812	30		do	2	Mechanics	1	Trammers	8
					Carpenters	1	Skip tenders	2
Block 815	18				Watchmen	1	Trackmen	2
					Laborers	4	Timbermen	2
900 drift N	6	12	do	2			Pumpmen	2
							Laborers	5
1000 drift N	23		do	1				
Shaft No. 4		32	do	6				
Drainage tunnel		22	do	4	Overtime		Overtime	
					Laborers	2	Blacksmiths	1
	168	66		19		18		53

FIG. 30.—Daily Mine Report.

records of stocks on hand. The stocks of explosives should be checked at the end of the month and any shortages charged out to the costs of the current operations.

Tramming Report (Fig. 32).

A report is made out by the boss trammer of each shift, stating the number of cars of ore and waste trammed from each working face; the number of cars of ore sent to the mill, cars of waste hoisted and dumped into old stopes, approximate distances trammed, etc. This report gives the mine foreman and the superintendent a definite idea as to how much work each set of trammers is doing.

POWDERMAN'S REPORT Date_____

_____
Powderman

Account of	Working Face	Dynamite, lbs.			Fuse feet	Water Fuse feet	Caps each	Protectors each	Remarks
		Straight 40%		Gelatin 50%					
		⅜″	1¼″	1¼″					
Company	*Stope 9 110-135*		*10*		*60*		*10*		
John Evans	*Drift 1200 North*			*40*		*200*	*20*	*20*	

FIG. 31.—Powderman's Report.

TRAMMING REPORT Date_____

Shaft No._____ Shift_____ _____ Trammer Boss

Level No.	Working Place	CARS			Dist. Tramm-ed feet	Dist. feet by No. Cars	Total Cars Tramm-ed	No. Tramm-er Shifts	Cars per Tramm-er	Ave. Dist. Tramm-ed	Remarks
		Ore to Mill	Waste to Surface	Waste to Old Stopes							
7	100-120	15			200	3000					
				3	500	1500					To 8 150-170
	142-164	20			600	12000					
		35		3		16500	38	2	19	434	
8	60-90	12			150	1800					

FIG. 32.—Tramming Report.

HOISTING REPORT Date_____

Shaft No._____ Shift_____ _____ Toplander

Level No.	Cars Ore to Mill	Cars Waste to Dump	Total Cars Rock Hoisted	Trips with Men	Trips with Supplies, &	Remarks
7	35		35	4	1	

FIG. 33.—Hoisting Report.

Date	Mach. Shifts	Labor: Machine Runners	Machine Helpers	Shovelers	Timbermen	Timber Helpers			Explosives: Dynamite lbs.	Caps each	Fuse ft.	Timber: 10" x 10"	8" x 8"	6" x 6" Running	2" x 12" Running		Feet			Tramming: Cars Ore	Cars Waste	Hoisting: Cars Ore	Cars Waste
1	3	3		1	1	1			42	15	72			40	36					47	6	47	1
	2	2		1					35	12	60									32	4	32	1

Month Nov. 192– Stope 7 100-120N

Continued from above

Estimated Costs: Machine Drills	Labor	Explosives	Timber	Tramming	Hoisting	General Charges	Total	Production: Ore Broke: Tons	Assay	Total Value	Total Tons	Average Assay	Cost per Ton	Ore Trammed: Tons	Assay	Total Value	Total Tons	Average Assay	Cost per Ton
														35	6.00	$210			
														24	8.20	197	59	6.90	
																407			

FIG. 34.—Working Face Record.

Hoisting Report (Fig. 33).

The Hoisting Report is made out by the top-lander or hoistman of each shift. It shows the number of cars or skips of ore and waste hoisted, trips made for other purposes, etc. This report must check with the corresponding Tramming Report.

Working Face Records (Fig. 34).

Cost records for each working face are most easily kept as estimates, which are not dependent upon the general accounts, although the totals as extended for the month should not differ materially from the full book costs. These records are used to determine the relative cost per ton, as compared with the average grade of ore recovered, from the work in each stope; they are also kept for each heading, to show the cost of the work per foot and per ton of ore recovered. As the tonnage from any stope can only be approximated in most cases, it is evident that fine details of cost-keeping for this work are not needed. Costs per foot of advance in the headings can be determined with accuracy, but the estimated costs are close enough for all practical purposes. Fig. 34[1] shows a form for stope records; a similar form should be used in determining costs per foot of advance and per ton of ore recovered from development work, and per foot of advance or per cubic foot for dead work. A standard wage for each class of labor is assumed in the example given. At convenient intervals during the month, the totals for the month-to-date are added and the corresponding amounts are extended to the columns under "Estimated Costs" to obtain the costs per unit.

[1] Peele's "Mining Engineers' Handbook," page 1277.

CHAPTER TEN

MISCELLANEOUS

Machinery Index (Fig. 35).

An index should be kept of all machinery which is liable to be moved about from one place to another, as electrical apparatus, hoists, pumps, etc. A record of this kind will be found of particular value for properties where the work is more or less scattered. A complete history of each machine should be kept, showing where it has been used, important repairs and replacements, present location, etc.; minor repairs need not be considered. Fig. 35 shows a suitable form of index for this, purpose. The name, local serial number and manufacturer's rating are stated upon the card, and a complete record of the machine is kept, the last entry showing its present location. The main subheadings of the index, as generators, hoists, motors, etc., are made by division cards tabbed at the left hand side of the index as indicated. Upon the upper margin of each card of the index are divisions showing the different places where the machine may be used, as power house, mine, mill, etc. A movable clip is fastened upon the space showing the location of the machine, the clip being changed to indicate the new location each time that the machine is moved. When the card is in the index, it is filed under the subheading to which it belongs, as generator, motor etc., the rows of clips showing the machines which are in each place. In the example given, the location of the marker shows that the motor in question is at Shaft No. 1.

Machine Repair Parts (Fig. 36).

For the upkeep of air drills, compressors and other machinery, a large assortment of small repair parts must be kept on hand, and it is important that the stock of these parts is not allowed to become depleted. Fig. 36 shows a form for keeping account of these items; the records are posted month-

MOTORS | *Marker*

No. M46

Power House	Ware House	Mine	Mill	Shops	Shaft No.1						Not in Use	

Machine:-HOIST MOTOR *Rating*:- No. 182445, Type ITC, 5009, Form M. 60 cycle
Mfr.:- General Electric Co. 780 RPM, 30 HP, 85 Amps, 220 volts.

August 30, 19—	*Installed in machine shop*
Nov. 18. 19—	*Burned out; taken to power house for repairs*
Dec. 15. 19—	*Stator completely rewound; transferred to mine warehouse*
March 11, 19—	*Installed on hoist; Shaft No. 1*

FIG. 35.—Machinery Index.

Machine Drill JACKHAMER BCR 430 Ingersoll Rand Co.		Stock on hand 1st of month	January	February	March	April	May	June	July	August	September	October	November	December	Total
01BC43	Handle	On hand	3	3	3	2	2	2	2	2	5	5	4	4	
		On order				3									
		Received								3					
		Issued			1							1			2
050BC43	Handle Grip	On hand	6	4	4	4	2	8	8	8	8	5	5	5	
		On order		6											
		Received						6							
		Issued	2			2					3				7
06BC43	Handle Bolt and Nut	On hand	5	5	5	4	4	8	8	8	7	6	6	6	
		On order		4											
		Received					4								
		Issued			1					1	1				3
7BC43	Handle Bolt Washer	On hand	4	4	4	4	3	3	3	3	3	3	6	4	
		On order							3						
		Received										3			
		Issued				1								2	3
83BB1	Oil Plug	On hand	6	4	4	2	8	6	6	5	4	4	2		
		On order		8						8					
		Received				8									
		Issued	2			2	2			1	1		2		10

FIG. 36.—Machine Repair Parts.

ly from a separate book kept at the warehouse, into which the daily issues and receipts of repair parts are entered. From these records, the approximate consumption for any repair part can be seen at a glance, for guidance in determining the quantity to be kept in stock.

Contract Work.

To avoid misunderstandings, and to furnish a record for future reference, contract or bonus agreements should be made out upon a Contract form (Fig. 37) which is signed by both the foreman and the contractor. These forms should be stamped with a serial number and should be made out in duplicate; one copy is filed at the foreman's office and the other at the general office. They should be filed under the name of the contractor while in effect, those no longer in use being transferred to the back of the index and filed according to the mine workings or other classification of the contract.

Personal Records (Fig. 38).

Every person to whom the company considers giving employment should be required to fill out a Personal Record form when he applies for work. These are placed on permanent record and a live file of men actually employed is kept; the records of men who have left the employ of the company and of those who are considered undesirable from their records are placed for reference in another file, with notations as to date and reasons or leaving, reasons for not giving employment, etc.

Smelter Shipments.

When ore or concentrates shipments are hauled from the mine to the railroad, a local way-bill should be used for the purpose, similar to the form of freight way-bill shown in Fig. 21. Arrangements are made with the railroad for cars by the company's forwarding agent, who also attends to the loading and shipping of the ore. Shipment is usually made directly to the smelter, where the ore is weighed and sampled before a mine representative. If the results of the smelter analysis are not satisfactory to the shipper as a basis of settlement, a

MARY MINING CO. No. 1476
Contract Form

Mining Department Date June 1st, 192—

John Doe agrees to do the following work on terms stated:—

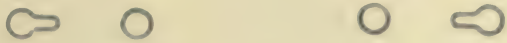
	Price per unit	Total
Stoping at block 810		
Grade of ore	*Per Car*	
$5.00 to $7.00	*$0.50*	
7.00 to 9.00	*0.75*	
9.00 to 12.00	*1.00*	
Above 12.00	*1.50*	
Per full car, delivered at Shaft No. 1		

The above work to be done under the supervision of the foreman or representative, and to his satisfaction.

Foreman

Contractor

FIG. 37.—Contract Form.



Name..... No.....

Date applied for work..... Date employed.....

Class employment desired..... Employment given.....

Rates.....

I understand that the above rate will continue in effect until a definite arrangement is made at the time-keepers' office for a change in rate.

Age..... Nationality.....

Relationship, if any, to foreman.....

In case of serious accident notify.....

By what company were you last employed.....

Reasons for leaving.....

All of the above statements are true to the best of my knowledge.

Give names of two former ....

employers as references .....

Signed.....

Address.....

Employed by..... Dept.....

Date of leaving & reasons.....

.....

FIG. 38.—Personal Record Form.

	Date	Lot No.	Car No.	Class of Ore	Shipped to	Mine Wt.	RAILROAD WEIGHTS		
							Gross	Tare	Net

Cont. from above	SMELTER WEIGHTS			MINE ASSAYS												
	Wet	% H2O	Dry	Au oz	Ag oz	Pb %	Cu %	Fe %	CaO %	SiO2 %	Zn %			Au oz	Ag oz	Pb %

Cont. from above	SMELTER ASSAYS							BASIS OF SETTLEMENT										
	Cu %	Fe %	CaO %	SiO2 %	Zn %			Au	Ag	Pb	Cu	Fe	CaO	SiO2	Zn			Treatment

Cont. from above	NET VALUE		RAILROAD DEDUCTIONS			FINAL SETTLEMENT		Date of Settlement	REMARKS
	Per Ton	Total	Frt.	Switching	Total	Per Ton	Total		

FIG. 39.—Smelter Shipments Record.

part of the smelter sample is sent to a customs assayer, who has been accepted by both parties, and the settlement is based upon his returns. If the railroad freight rate varies with the grade of ore, as is commonly the case, a copy of the final analysis is sent to the railroad company's office, as a basis for determining freight charges upon the shipment.

COST STATEMENT FOR MAY, 192-.

No.	Account	Current month				Totals to date			
		Labor	Supplies	Sundries	Totals	Labor	Supplies	Sundries	Totals
	General Expense:								
61	General office exp.	215 11	14 45	5 00	234 56	316 36	58 79	10 00	385 15
69	Policing	36 75			36 75	168 75			168 75
612	Water supply	124 93	30 44		155 37	144 15	34 64		178 79
616	Tools account	22 14	182 14		204 28	22 14	1013 17		1035 31
	Totals	398 93	227 03	5 00	630 96	651 40	1106 60	10 00	1768 00
	Furniture & fixtures		34 40		34 40	17 10	143 15		160 25
	Constructions & improvements:								
901	Supply house & office	74 51	37 13		111 64	524 90	529 26		1054 16
902	Compressor No. 1								
902a	Cost at siding	9 82		2350 00	2359 82	9 82		2350 00	2359 82
902b	Moving to property		14 05		14 05	284 51	181 31		465 82
902c	Foundation		7 25		7 25	472 69	131 40		604 09
902d	Installation	44 94	31 56		76 50	111 45	69 75		181 20
	Totals	54 76	52 86	2350 00	2457 62	878 47	382 46	2350 00	3610 93
903	Hoist No. 1								
903a	Cost at siding	6 30		1215 88	1222 18	6 30		1215 88	1222 18
903b	Moving to property		1 27		1 27	142 25	16 39		158 64
903c	Foundation					248 05	107 25		355 30
903d	Installation					97 18	17 42		114 60
	Totals	6 30	1 27	1215 88	1223 45	493 78	141 06	1215 88	1850 72
904	Hoist & Compr house	145 75	87 33		233 08	343 81	120 47		464 28

FIG. 40.—Cost Statement.

Freight charges are paid by the smelter and deducted when settlement is made for the shipment. When ore from the mine is sorted and shipped, instead of being treated as mined, a "Sorting, Weighing and Loading" account should be opened to take the place of the treatment accounts. All information concerning ore shipments should be kept in one book; Fig. 39 shows a typical form for this record.

Records for New Operations.

In starting a new mining enterprise, a period of construction usually preceeds the commencement of actual mining operations. In any case, it is essential to a complete record of costs that an adequate outline for bookkeeping be ready for immediate use at the time when work is started. To this end, unless the bookkeeping system has been worked out in advance, tentative forms for the most essential records, as Cash Journal, General Distribution, etc., may be made upon tracing linen and black-process prints from these used until the most convenient arrangement for the work at hand has been decided upon. A supply of printed forms for time books, material requisitions, etc. should be provided for use until the permanent office system has been installed. Cost statements during the early stages of the work may be made up without the use of printed forms: see Fig. 40.

CHAPTER ELEVEN

MERCANTILE STORE OPERATION

This outline applies to the operation of a comparatively small company store, where the store transactions are carried on the books at the general office. The system of accounting employed should afford a positive balance between the cost of goods purchased, as compared with the total value of goods going out of the store and of the remaining stock by inventory. The problem of keeping account of merchandise stock is more difficult than in the case of warehouse supplies, in that the stock of the mercantile store is purchased at one price and resold at a profit. This difficulty can be most readily overcome by charging out all goods to the store department at *selling* prices, which are fixed for each shipment of goods at the general office as received. This method furnishes a check upon the merchandise handled, by putting the store department upon a one-price basis; it eliminates the necessity of carrying both cost and selling prices, as must be done if the stock is charged out to the store department at cost.

Purchase Orders.

Purchase orders, similar to those used in ordering warehouse supplies, should be employed in ordering merchandise stock for the store. A form by which the store-keeper can notify the general office of new merchandise stock needed should also be used.

Merchandise Register (Fig. 41).

This record should be made out in duplicate, the original being held at the general office and a copy for each shipment sent to the store-keeper. The record contains all details concerning shipments of goods and furnishes the final cost of each item as deliverd at the store. The selling price to be charged for each article is fixed at the general office. An

	Purchase Order		Date Rec'd	Purchased from	Article
	No.	Date			
	916	Oct. 9, 192	Oct. 27	Jackson Grocery Co.	Rice

Continued from above

Unit	Quantity	Invoice Cost	R.R. Freight	Local Hauling	Misc.	COST		SELLING		Remarks
						Total	Per Unit	Total	Per Unit	
lb.	500	50.00	2.00	1.00		53.00	.10¢	65.00	.13	

FIG. 41.—Merchandise Register.

index of the articles appearing on the Merchandise Register should be kept, as an aid in finding the records of past shipments of goods received.

MARY MINING CO.,	•	Good
Merchandise Coupon	•	for
25146	•	10
NOT GOOD IF DETACHED	•	Cents
MARY MINING CO.,	•	Good
Merchandise Coupon	•	for
25146	•	10
NOT GOOD IF DETACHED	•	Cents
MARY MINING CO.,	•	Good
Merchandise Coupon	•	for
25146	•	10
NOT GOOD IF DETACHED	•	Cents
MARY MINING CO.,	•	Good
Merchandise Coupon	•	for
25146	•	10
NOT GOOD IF DETACHED	•	Cents
MARY MINING CO.,	•	Good
Merchandise Coupon	•	for
25146	•	10
NOT GOOD IF DETACHED	•	Cents

FIG. 42.—Store Coupon Book.

Record of Losses and Gains.

A memorandum book should be kept by the store department, showing losses and gains due to changes in prices of

stock on hand to conform to those of new stock received, losses due to spoiled goods thrown out, to reductions in prices which may have been necessary to dispose of unsalable goods, etc.

Coupons (Fig. 42).

To avoid the necessity of keeping an extensive set of accounts, credit in the small store may be extended to the workmen by means of coupons, issued by the time-keeper; metal checks for varous amounts are sometimes used instead of coupons The coupons are orders of small denomination upon the store; they are made up in book form, each book bearing a serial number which is stamped upon every coupon

	Cash		Coupons		Payrolls		Merchandise		Coupons Outstanding	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
Coupons received from printer.	15000			15000						
Coupons issued to workmen...		7500			7500					
Merchandise sold.....	2000		7000					9000		
Coupons outstanding.....	500									500
	10000			8000	7500			9000		500

Fig. 43.—Diagram of Store Coupons Transactions.

contained in it. The books are usually made up in several convenient amounts. A Coupon Register, showing to whom each book was issued, should be kept by the time-keeper, and the workmen are required to sign this record for coupons received. Two accounts should be opened upon the general office books for handling coupon transactions; these accounts are called

(1) Coupons
(2) Coupons Outstanding

The Coupons Account shows the total amount of unissued coupons on hand; Cash is charged and Coupons credited with all unissued coupons as received. The Coupons Outstanding Account shows the amount in coupons which have been issued and not turned in at the store in exchange for merchandise by the end of the month. An example of entries for handling the coupons accounts is given in Fig. 43.

Bought of Virginia M.& M. Co.
Mercantile Store
Date..... No.....
Name.....

No. 3865 - 14
Charge Acct. Slip

FIG. 44.—Store Sales Slip.

Charge Accounting.

Instead of using coupons, a system of sales slips and card index of individual charge accounts is very satisfactory for a more extensive store business, although more clerical work is required than by the use of coupons. A Sales Slip (Fig. 44), is made out by the clerk for each sale, in duplicate for a charge account sale and in triplicate for a cash sale. For a charge account sale, the original sales slip is held by the store cashier, the duplicate being handed to the customer with his purchases after the sale has been approved–*i.e.*, after the customer has been found to have a credit balance to cover the amount of the sale or has been identified as being carried on open account. For a cash sale, the original is sent to the cashier, one copy is held by the clerk who made the sale, and the other copy is handed to the customer. At the end of the day, the duplicate cash slips are collected from the clerks and checked with the cash and with the original slips as sent to the cashier. A card for each employee is filed in the Charge Account Index (Fig. 45) and his time as reported by the timekeeper's office is entered daily upon it to determine his net credit balance. After the end of the day, the charge account sales slips are arranged in the order of the employees' numbers and the total amount from each slip is entered upon the corresponding card; this work is done rapidly by the use of an adding machine designed for this purpose. The sales slips for each day are bundled and filed for record.

Store Accounts.

The following accounts will be needed for handling the store business on the general office books, on the basis of selling prices:

(1) Merchandise
(2) Store
(3) Store Earnings
(4) Store Expense

Merchandise.

This account is charged with the cost of merchandise received and with the estimated gross earnings to be realized

Employee's No. *317* Month of *July* 192–

Name *Fred Brown*

Net Bal. from previous month *26.15* House Rent *10.00* Doctor Bills Ware-house

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		Rate	Amount
1	*1*	*1*	*1*	*1*	*1*	*1*	*1*									*4.00*	
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31		

July 1 4.00
1.25
5.25 *

3 5.25
2.10
7.35 *

6 7.35
2.00
9.35 *

FIG. 45.—Store Charge Account Index.

from the sale of this stock, as determined at the end of the month from the Merchandise Register. The account is credited with the selling price of all goods delivered to the store.

Store.

This account is charged with the selling price of all goods delivered to the store; it is credited with all goods going out, as sales, spoilage and other losses, etc.

Store Earnings.

This account is credited with the estimated gross profit to be realized from the sale of goods received; it is charged with all expenses of carrying on the business.

Store expense includes all current expenses for salaries, stationery, etc. Taxes and insurance are carried in suspense, and are apportioned to Store Expense in equal monthly installments. They are handled in the same manner as the taxes and insurance charges under the mine accounts. The Store Expense Account is closed into Store Earnings at the end of the month.

The bookkeeping in connection with the operation of the store department on the basis of selling prices will be explained by considering an example. In order to show the monthly entries and also the method of balancing the store accounts at the end of the year, we shall assume that a new store business is being started on December 1st; see Fig. 46.

(1) This entry shows the cost price of all stock received at the store to Jan. 1st.

(2) The selling price value of the total stock is determined at the end of the month from the Merchandise Register.

(3) The estimated total unearned gross profit is the difference between the total cost and selling prices as given in (1) and (2).

(4) This entry comprises the total sales of merchandise made during the month.

(5) Expenditures are debited to Store Expense as they occur and the account is closed out to Store Earnings at the end of the month.

(6) The total amount of this entry is taken from the Record of Losses and Gains at the end of the month.

(7) & (8) The balance of the above entries shows that the store should

have a stock on hand of $15,970 at the end of the year. If the inventory shows an actual stock of $15,900, this amount is charged to Merchandise and credited to Store to close out the accounts for the year. The shortage is credited to Store and charged to Store Earnings.

(9) The total stock purchased has cost $20,000; it has been charged out

	Merchandise		Store		Store Earnings		Store Expense		Cash		Profit & Loss	
	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.	Dr.	Cr.
(1) Stock purchased, cost price	20000									20000		
(2) Stock purchased, selling price		25000	25000									
(3) Estimated unearned gross profits from total stock	5000					5000						
(4) Goods sold during Dec.				9000					9000			
(5) Store expense					500		500	500		500		
(6) Spoilage & losses				30	30							
(7) Inventory, Dec. 31	15900			15900								
(8) Inventory shortage, to balance				70	70							
(9) Estimated unearned gross profit from stock not sold		3180			3180							
(10) Net profit					1220							1220
Balance, Dec. 31	12720		Closed		Closed		Closed			11580		1220
(11) Stock on hand, Jan 1, selling price		15900	15900									
(12) Estimated unearned gross profit from stock on hand	3180					3180						

FIG. 46.—Diagram of Store Transactions.

to the store department at $25,000. Then the cost price of goods on hand at the end of the year, with an inventory value at selling prices of $15,900, may be taken as

$$\frac{15{,}900 \times 20{,}000}{25{,}000}$$ or $12,720, the amount which will appear upon the General Trial Balance; the difference of $3,180 is estimated gross profit not

yet realized, as the goods have not been sold. Accordingly, $3,180 is credited to Merchandise and charged to Store Earnings.

(10) The balance of the Store Earnings account shows a net profit of $1,220; the total balance of this account for the year is charged off the Profit and Loss.

(11) At the beginning of the new year, Merchandise is credited and Store is charged with the selling price of the stock on hand as shown by inventory.

(12) Merchandise is charged and Store Earnings credited with the estimated gross profit of $3,180 to be realized from the sale of stock on hand.

Inventories.

Inventory of merchandise stock is usually taken once or twice a year; the practice of taking occasional inventory at unexpected intervals may sometimes be advisable.

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